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SORRY BUT YOU'RE WRONG ABOUT IT

BY ALBERT EDWARD WIGGAM

The New Decalogue of Science
The Fruit of the Family Tree
The Next Age of Man
Exploring Your Mind
The Marks of an Educated Man

THE MARKS OF A CLEAR MIND

or

Sorry But You're Wrong About It

By

Albert Edward Wiggam, D. Sc.

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PRINTED AND BOUND BY THE CORNWALL PRESS, INC., FOR
BLUE RIBBON BOOKS, INC., 448 FOURTH AVE., NEW YORK CITY

With affectionate regard
to
GEORGE AND LENA ARENTS
whose lives of simplicity, sincerity,
helpfulness and beauty are beacon
lights along the Way of Life, which
the author hopes this book may aid
others to follow

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PREFACE

It is not the purpose of this book merely to explode a series of popular fallacies. It is written with the hope that it may induce a larger number of people to do their thinking by the analytical methods of science. I could have chosen hundreds of other popular fallacies to explode, but I have confined myself largely to wrong popular beliefs about psychology and biology, simply because wrong beliefs in these fields, especially in our day, do incalculable damage.

I have addressed the book to the man in the street, Mr. Manstreet, as a convenient auditor. The most amazing and discouraging thing to me about modern life is that Mr. Manstreet, with his crude notions of science and his lack of the mental techniques for approaching life problems in a scientific way, is not, as you might suppose, the street-corner philosopher, the man who has never been to college and the poorly educated person generally.

I find Mr. Manstreet everywhere I go. He is the man who has somehow never gained the scientific attitude and who must therefore remain all his life among the half-educated. Many lawyers, doctors, preachers, business men, editors, writers, poets, artists, college professors, as well as traveling salesmen, skilled mechanics and small business men, seem to have their heads about equally full of strange notions of nature, uncritical beliefs which if true would mean that all the science they are daily using, and by which they are getting rich—at least richer than human beings ever were before—can not be true. If science is at all a correct method for profitably studying any natural phenomenon, its methods are valuable for studying all natural phenomena; but it is rare indeed in this age of science to find people, outside the faculties of science in the universities, who have any understanding of what science is, who have any of its caution and its rigidity of logic in their thinking about life and nature.

As I urge again and again throughout this book and throughout all my books, science is only a small part of life; it is only one approach to truth; but in its own domain it is supreme. It can brook no rival. It knows no mercy; it is utterly inhuman. It knows no friends, no enemies; it has no heart, no emotion, no passion, except one, the passion to think straight, the passion not to be fooled, and not to fool any one else. There is nothing mysterious about it at all. Indeed its whole passion is to remove mystery, to replace mystery with knowledge.

But it is rare to find persons to whom the scientific attitude has become a *manner of life,* persons who can not think about the simplest and commonest problems in any other way. Yet there are such persons; and the moment you meet one of them you know you have met a thoroughly trained mind. I have puzzled a great deal to know how such persons get that way, because sometimes they are farmers, mechanics or laboring people. Some of them have not had wide contacts with scientific work, at least with its theory and methodology; but somehow they have caught the point, they have grasped the attitude, or rather the attitude has grasped them; and once the scientific attitude lays hold of a man's life it never lets go. From that hour he is a changed man; he may be going forward slowly but he is always going forward. He is always journeying toward greater truth, deeper insights and a sounder philosophy—a philosophy based on things as they are, as his critical intelligence has been able to discover them, instead of philosophy drawn from the false world which the wishful thinking of mankind is for ever erecting in order to escape reality.

If this book should help any one to the scientific view of life and nature, my reward will be rich for the labor expended, for it gives life tolerance and sweetness, gentleness and beauty, simplicity and directness and at the same time multiplies its social effectiveness.

It would require pages merely to name the scientific friends to whom I am indebted. Nearly all the chapters have been carefully read and scrutinized by one or two leading scientists in the field of thought and investigation touched on. It is always my habit in describing any important research to submit my description for criticism and suggestion to the scientist who has made the research or to some colleague thoroughly competent to render judgment. It has been in this way that for the past thirty years I have been doing my utmost to clarify my own thinking and add to my education. My thanks are due to these many scientific friends.

My thanks are due to *Good Housekeeping* for the privilege of reprinting the chapter on Juvenile Delinquency and to the *American Magazine* for permission to reprint the chapter on "How to Win an Argument." My special thanks are due to Mr. Ray Long, former editor of *The Cosmopolitan* and Mr. William C. Lengel, associate editor, for their encouragement in the preparation of an article along the lines of this book. Indeed, it was due to a conversation with Mr. Lengel that the idea of the original article and, subsequently, the present book arose in my mind, although I had been gathering material of this type for many years.

As is the case with all my books, Mrs. Wiggam is a co-author. But for her wide reading in technical literature and her patient searching through libraries for pertinent material, as well as her constant aid in editing, and her unbiased and penetrating criticism, the book would have been impossible.

A. E. W.

New York City,
July 20, 1931

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SORRY BUT YOU'RE WRONG ABOUT IT

SORRY BUT YOU'RE WRONG ABOUT IT

Chapter I

You are wrong if you believe

THAT POPULAR NOTIONS ARE NOT ALWAYS WRONG

Popular notions are always wrong. They have to be wrong. The human mind is so constructed, my dear friend Manstreet,—both yours and mine,—and it operates in such a way that all general impressions and beliefs about matters of fact and the laws of nature which have not been corrected and tested by that particular way of thinking called science are bound to be wrong.

In fact, Manstreet, the popular notion that popular notions can be believed is in itself a wrong popular notion.

The so-called "accumulated wisdom of the ages," in so far as it relates to the nature of nature and human nature, and the operations of natural law, is mostly accumulated tommy-rot. The only exception is the small portion of wisdom which has been the product of scientific investigation or of philosophical thought sufficiently critical to criticize itself.

It is the purpose of this book to defend this thesis and to plead for a genuine scientific liberalism throughout the whole of human life.

These statements, my dear Manstreet, do not apply to notions of art and religion. The object of art and religion is to inspire, exalt and console. They appeal in the main to the emotions; science appeals in the main to the reason. It appeals to the characteristic of the mind that finds what Professor Thorndike calls a "satisfyingness" in logical relationships; although we must never forget what Prof. John Dewey and Havelock Ellis are fond of pointing out, and what scientists sometimes do forget, that science is itself an art. As Professor Dewey says in the greatest of his great books, *Experience and Nature,* science is "a matter of perfected skill in conducting inquiry," that is, an artistic way of using the reason. Science, Manstreet, is the effort men have made to reduce a certain limited portion of human experience to measurement and number. Compared to the whole of man's experience, the area that comes within the province of science is very small indeed.

In achieving its "perfected skill in conducting inquiry" into the operations of nature, the mind must be sensitive to harmony, perspective, color, form, size, distance and all those relationships and values which are the subject-matter of the imagination when it is engaged in the creative endeavors of art. In this sense then, science is an art; yet, as Professor Dewey points out, science differs from what we commonly call art because "for better or worse, it is at least 'there'; it is a definite body of facts and principles summed up in books and having a kind of independent external existence." But art, in the common acceptation of the term, is a thing created out of man's emotion—his loves, hatreds, fears, sufferings, hopes, and his insatiable longings for self-expression.

It is for a purpose that I mention at the beginning of my talks with you, Manstreet, this difference between the truths of science and the truths of art and religion, and the different ways by which man achieves them. When I say, as I shall very often, that your head is full of popular notions in the limited area of human experience where science and the use of reason is supreme, and that these notions are always wrong, I do not wish you to think that I regard you in any sense as an ignorant man; although, just because you have never developed the habit of using your mind as the scientist is forced to use his to discover his contributions to truth, you often become the victim of ignoramuses.

It is possible, indeed probable, Manstreet, that you are a more cultivated man in many ways and a better scholar than I am. I often hear you talk on art and religion and the life of beauty with more depth and penetration than is possible to me. I read your books, I gaze upon your pictures, your sculpture and architecture, your esthetic dances, and I listen to your music, with a sense of mingled exaltation and despair—despair, because, with the magic of your art you set me down in the presence of unattainable excellence; exaltation, because in the same moment you fill me with a sense of infinite potency. Whenever you do this, and whenever I can grasp, even vaguely, the truths of art and religion that you reveal by *your* method of revealing truth, you always inspire my mind with the sense of having tapped some unused reservoir of energy; you stamp new conceptions of the wonder and beauty of the world on my imagination; and you light with new loveliness the human pathway.

But when we turn from art, as defined in this incomplete way, to the thing we call science, also defined in this incomplete way, we come instantly into the field of cold calculating reason, into the fields of experiment and mathematics. And, while, as I say, many of the truths of nature and life can not be discovered by the reason, yet the operations of nature can not be studied profitably in any other way. As a consequence, therefore, all notions about the operations of natural law that have arisen from heaven knows where and that have not been the product of the reason—notions that hold a powerful sway over the minds of men and have profoundly influenced the stream of history—can never be correct. The moment you try to explain matters of fact and natural law by any method except the method of experimental science and critical analysis, from the very nature of the case and from the nature of your mind, you are of necessity wrong and you do not know you are wrong, or why you are wrong, or how to correct your own errors.

It is, therefore, with the hope of proving to you, my dear Manstreet, these apparently simple statements that I venture to ask you to listen while I present what seems to me abundant evidence. It is with the hope that I may win you to my way of thinking about these matters and that I may show you how they affect your character, your social and political attitude, your views of life and your pocketbook that I venture to ask you to sit down with me here in my workshop on this afternoon of the twentieth of April, 1931, and have a few friendly chats about the wrongness of all popular notions of life and nature that come within the purview of science.

CHAPTER II

You are wrong if you believe

THAT PRACTISE MAKES PERFECT

IN ONE sense you are right about this notion, Manstreet. Practise does make perfect, but you fail to observe that it perfects your errors just as rapidly and intensively as it does your successes. That is why men who practise at golf year after year often get worse instead of better. There is enormous value in securing the right instruction for any skill at the very beginning. After reaching a certain degree of proficiency, most people never improve in any skill. They practise their errors until they become perfect in them. This is true of the errors they make in the techniques of their thinking. As we shall see in the following chapter, they go on accumulating wrong popular notions because they never correct the errors in their methods of thought. They practise wrong methods until they reach perfection.

CHAPTER III

You are wrong if you believe

THAT EVERY ONE HAS A RIGHT TO HIS OPINION

THE scientist, my dear Manstreet, is nearly always wrong, but he is the only person who on matters of fact and natural law is ever right, and who, at the same time, has methods of proving he is right. He is, therefore, the only man who on such matters has a right to an opinion. The man in the street, whom you represent, is always wrong on such matters and is the only man who is never right. He, therefore, has no right to an opinion.

Even, if by chance, the man in the street should be right he would not know it. He has no way of knowing it or of proving it. He has no way of knowing when he is right any more than he has of knowing when he is wrong. He has no better evidence in one case than in the other. His opinion, therefore, in either case is both worthless and dangerous.

But while the scientist is nearly always wrong, every now and then he finds that out. You never do, because you do not know how. It was probably the greatest intellectual achievement in the whole history of man when he discovered how to correct the errors of his own thinking. For example, a million men guessing how far it is to the moon would be no better than one, simply because if one of them should accidently hit it exactly he would not know it. The man who hit it would have no more evidence than the man who missed it. The man who guessed it was just beyond the top of his neighbor's barn would have just as much evidence in his favor as the man who guessed it was two hundred and forty-one thousand miles away. But the scientist would soon find out whether his guess that the moon was just beyond his neighbor's barn or that it was two hundred and forty-one thousand miles away was the better guess; and after a deal of guessing and each time finding out which was the better guess, and throwing out all his wrong ones without hesitation or regret, he would finally make a guess that he could prove was almost exactly right. Not quite right, of course, because science has probably never been exactly right about anything. But the scientist can tell just about how nearly right he is and calculate his own probable error

It is true that there are numerous problems both in life and nature about which any guess stands a fifty-fifty chance of being correct. These are what logicians call "either or" problems. As examples, it will either rain or shine; the next child born will be either a boy or a girl; the earth turns either to the east or to the west, to the north or to the south; men are either more intelligent than ants, or they are not; if the murder was not committed in the daytime it must have been at night; if at night it was either in the light or the dark of the moon, and so on. But even in these cases the man in the street has no way of knowing whether he is right or wrong, and he is just as positive in one case as in the other. So here again he has no right to have an opinion.

But the scientist, as a result of his being able to discover his own errors and to calculate not only in which direction they likely fall but just about how large they are, is constantly improving his guesses and getting closer and closer to the truth. You, Man-street, never get any closer to the truth because you never improve your guesses or even your method of guessing. You do not know how to improve them.

Except where you have accepted the corrected guesses of the scientist you are still making the same old guesses to-day, and spending your money to back them up, that your ancestors were making when they first came down out of the trees and set up in the business of civilization. As a consequence of this wrong way of thinking, I repeat the "accumulated wisdom of the ages," in so far as it has sought to explain the facts of nature including the operation of man's own mind, is in the main accumulated nonsense. The nonsense is still accumulating. Indeed the tragic and astonishing thing is that the very discoveries and inventions of the scientist are helping it to accumulate. In this day of cheap printing, newspaper and bill-board advertising, the radio and congressional oratory, it is accumulating faster than ever.

Now the reason, Manstreet, why you are not constantly improving your guesses, and thus getting closer to the truth and accumulating real knowledge and growing wiser thereby as the scientist is always doing, is because you have four fundamental habits of mind that constantly lead you into error. These four mental habits are the chief causes of the wrong popular notions that have always infested the world. They are so simple and so obvious that it really seems amazing you are not aware of them. The chief difference between you and the scientist is that he has become aware of them, and tries his best to throw them off. Wherever he has a chance to teach your children he succeeds amazingly in preventing them from ever falling into these habits at all. It is his success in starting children to think right that gives me my largest hope for the sanity and safety of the future world.

The first wrong habit of mind that prevents you from discovering the truths of nature, Manstreet, is this:

You notice the exception to the rule.

You do not notice when a dog bites a man, but you do notice when a man bites a dog. You notice when the weather man is wrong, but you fail to notice that he is right eighty-six times out of one hundred. You notice when commonplace parents have a brilliant child, or homely parents have a beautiful child, or brilliant parents have a stupid child. You notice when married cousins have a defective child, but you do not notice that where they are healthy and of healthy ancestry they have somewhat better and healthier children than the average.

I could fill a volume with similar examples.

It is not, however, even at this point that the chief difference between you and the scientist is manifested. It is your subsequent mental operation from this point on that constitutes the second mental habit which prevents you from ever discovering either the truth of nature or the nature of truth. The scientist notices the exception to the rule vastly more often and more keenly than you do. Watching for the exception is one of the chief assets of his trade. But right there is the real difference between you and the vast change in mentality which was one of the chief intellectual factors that made the whole world of science. The scientist notices that it *is* the exception to the rule, but you do not. You mistake it for the general run of things and believe you have discovered a law of nature.

This brings me, therefore, to the second mental habit that prevents you from discovering or even accepting scientific truths, and which, until you give it up, will keep your head filled with wrong and often destructive popular notions. The second mental habit of fooling yourself into thinking you are thinking correctly is:

You draw general conclusions from particular instances.

As a result of this habit you never discover anything. You are never led by these exceptional occurrences to discover what the general rule really is. You guess as to the cause of the exception and fool yourself into thinking you have discovered a general law. The scientist not only notices the exception, and notices that it is an exception, but he cherishes it. It is the exceptions that often give him the golden key to the secret treasure house of nature which he is trying so desperately to unlock.

May I call your attention here to a great statement made by Prof. Alfred North Whitehead in his *Science and the Modern World?* In fact, to put it a bit bluntly, Manstreet, if you had had in boyhood the mental training necessary, or had now the temperamental passion to read and understand this book and develop the knowledge necessary for even a fairly clear comprehension of its vast historical and philosophical background, there would not be the slightest necessity for this book of mine. These informal chats would seem insufferably trivial and superficial in comparison. Professor Whitehead says: "It requires a very unusual mind to undertake the analysis of the obvious." And this unusual mental habit of analyzing the obvious constitutes the chief difference between the scientist and you.

That is to say, Manstreet, you notice only the exceptional occurrences in nature. You guess as to the cause of the exception and believe you have really analyzed the general operations of nature. So the obvious and usual order of nature completely escapes your observation. When you see the exceptional particular occurrence, the unusual thunder-storm, or the unusual child prodigy who dies young, or the genius who rises out of poverty, or the corporation president who never went to college, or the healthy man from a healthy family who is stricken with tuberculosis, and similar unusual occurrences, you believe you are witnessing the general order of nature. The scientist sees these unusual happenings far better and more often than you do; but instead of drawing the general conclusion that they constitute the order of nature, they may give him, as I have said, the long sought for explanation of what is indeed the obvious and usual behavior of nature. The scientist sees a thousand exceptions to expectation that completely escape you. He sees them every day in his laboratory. He sees them through his telescope. He notices for example that some planet does not swing precisely in its expected orbit. Ah, an exception to the rule! Instead, however, of concluding as you would that all planets go zigzagging about in this particular fashion, he notices at once that it is a most unusual bit of planetary behavior. By investigating the cause of the exception to the expected order of things, he straightway discovers the true orbit of a particular planet, obedient to invariable laws, and his whole celestial outlook is enlarged and clarified.

Indeed, it was chiefly this effort to analyze the obvious that led the men of the classical Greek civilization to seek by rational and experimental methods the general principles upon which nature operates. It was the Greeks who first discovered the systematic use of intelligence which we call science. I beg you never to forget this fact, Manstreet, for there is no better established truth of history. True, as Professor Whitehead points out, the wise men of the East had been puzzling for centuries "as to what may be the regulative secret of life"; but they sought to penetrate this regulative secret by continually weaving broad general principles, based largely on their observation of the strange, terrible and unusual happenings of nature, while the obvious details of the operations of nature all about them, which could easily have been put to the test of logical analysis, inductive observation and experimental demonstration, never interested them. The Greeks, far more than any other people, brought into the thinking of mankind the habit of analyzing the obvious, which in the main constitutes what Professor Whitehead calls the "scientific mentality." Failure to achieve it is one of the chief reasons why you both create and accept popular notions about nature and will continue to do so until the end of time. Your inveterate habit of drawing general conclusions from particular instances continually puts you "in bad" when dealing with the problems of your daily life and with the larger problems of nature, character and destiny.

The third mental habit that has caused a world of trouble and that prevents scientific liberalism from becoming the basic passion of men's lives is this:

You are afraid to let go of your old mental habits for fear if you did you might fall out of the universe.

Even in this age of so-called intellectual freedom, you are still fettered, in many fields of your thinking, by the most slavish slavery that can possibly bind the minds and hearts and bodies of men, namely the fear of authority. True, you think freely, as a rule, about chemicals and machines nowadays. But you are afraid to think openly and clearly about life and nature and ethics and character and your own history and destiny, just because you are obsessed with the notion that if you did something dreadful might happen. You have a very definite fear that if your free thinking should lead you to disagree with the gods or the fathers, or the authorities, or the traditions, or the social customs or with what your neighbors think, or with what some bigwig thought or said or did yesterday, it would get you into trouble.

One curious circumstance is that if this bigwig lived five thousand years ago instead of two thousand or three thousand you are more afraid than ever to disagree with him; and if he lived in the vague mysterious past at the "dawn of history," particularly if his sayings—which he probably meant as innocent wise-cracks or else deliberately got up to fool the people so he could more completely control them—were uttered in some cryptic form or mystical jargon that only the "initiates" can understand, his words seem an intellectual and ethical guide you dare not transgress.

There have been rivers of blood shed in the past—and I sometimes fear as many more will be shed in the future—because people were afraid that if they disagreed with these bigwigs and did a little thinking on their own account they would lose their immortal souls. And just so long, Manstreet, as people regulate their thinking and conduct with a view to securing rewards or avoiding punishments in some other world, they are not going to apply hard-headed intelligence and straightforward thinking to solving the problems that trouble us on this earth here and now. Just so long, too, as people do their thinking without constantly reexamining the utterances of the gods and authorities and bigwigs of the past, whether these bigwigs were scientists or philosophers or teachers or able and cunning men who deliberately deceived the populace to rule them, they will not become any wiser or accumulate the knowledge of nature and life which is necessary, if society is ever to become happy and free.

The fourth mental habit that prevents you from becoming an intellectually free man, that keeps the old wrong popular notions in spick-and-span repair as going concerns in society, is this:

Your passion to be important.

It seems to me, Manstreet, that civilization is in the main the outcome of three distinct trends in human nature: namely, hunger, the sex instinct and the desire to be important. I think the majority of psychologists and philosophers nowadays regard the desire for importance, the desire for the approval of one's fellows, the passion of rivalry, as the deepest urge in human nature. People will often go hungry and thwart the emotions of family life and the association of the sexes in order to secure public approval, in other words to keep up appearances.

Since this is perhaps, the most powerful motivation of human conduct, it is probably the hardest one to deny. But a difference between you and the scientist or critical philosopher is that you not only never try to deny this passion in order to gain correct opinions but you positively cultivate it as a means of gaining incorrect opinions. You believe the more you assert a thing and the longer it has been asserted, and the more people you can induce to agree with your assertion and the more slogans you can devise by which to assert it, and the more banners and brass bands you can collect in order to parade it before your fellows, the truer your opinions become. You call this, "piling up the evidence"; and the more evidence you pile up in this way the stronger becomes your determination not to change your mind.

In all this emotional mêlée you are not searching for truth, but trying to save your face. Very often the scientist falls into this error and to save face refuses to take back to-day something he said yesterday. Just as it takes an unusual mind to analyze the obvious, so likewise it takes an unusual mind to change its mind. A scientist does not always do this when he should as he is just as fond of his face as you are. But at any rate this readiness to about-face is the spirit of science, as it is the spirit of critical philosophy. It is the only attitude that makes the accumulation of knowledge possible. No discussion of scientific issues is possible by any other emotional approach.

In fact, Manstreet, we hear it constantly said that it "takes all sorts of people to make the world." I have never taken the time to examine this notion, but I imagine it is wrong simply because it is universally believed. At any rate I do not agree with it. Indeed, if we mean by "all sorts" of people a large number of distinct mental and temperamental "types" set off from one another by sharp dividing lines, I feel considerable assurance that it is not strictly true. I think Prof. E. L. Thorndike adduced sufficient evidence many years ago that there is just one type of humanity, namely, *mediocrity*. Men vary up and down from the average or the mediocre, but that they are set off one from another in discrete, discontinuous types which do not intertwine and overlap, I believe we have no sufficient evidence.

Without laboring this point, however, I think that in a general way we may say there are two pretty distinct classes of people that make up this "so-called human race."

> The first class consists of those people to whom their beliefs are more precious than the truth. The second class consists of those people to whom the truth is more precious than their beliefs.

Now this second class have made all the progress in natural knowledge that the world has ever had. The first class have never had anything to do with progress except to hold it back. They believe what they believe because *they* believe it. The second class believe what they believe because the logic of the facts compels them to believe it. The first class believe what they believe in spite of the facts. The second class believe what they believe in spite of themselves—in spite of their own prejudices, emotions, vested interests and preconceived opinions.

There is not the least mystery about these two classes of people. You meet them every day, and the thing that separates them is not wealth or social position, and I doubt that it is mental ability or number of days spent in school. It is simply their mental approach to the problems of nature.

I mention this because I wish to say to you again, Manstreet, that I do not regard you as being anything but a very cultivated man except in the field of the analytical and experimental sciences. You just do not happen to have trained your mind in those ways of thinking which are absolutely necessary to make scientific discoveries or to arrive at scientific truth. You may know a great deal *about* science, but you are not trained *in* science. You know a great many scientific facts. The ancients likewise knew a great many scientific facts, but they were isolated facts. It was not until the days of "the Greek miracle" that men developed the habit of seeing the relationships among these isolated facts. They erected this way of thinking about them into a genuine intellectual discipline. They furnished a continuous supply of men, generation after generation, who were interested in this way of thinking. So for the first time the human mind became really trained in science. And the thing that you have not achieved is this training in science, and as a consequence you belong to that class of people to whom their beliefs are more precious than the truth.

These people still retain the four mental habits that make the discovery of natural knowledge impossible.

I have this borne in on me by noting the mental habits of my friends, in several clubs to which it is my privilege to belong. I happen to belong, for example, to a number of writers' clubs, among whose members are many of the foremost and most influential writers of America. I must confess that in these writers' clubs I hear more notions about natural knowledge expressed dogmatically in the course of an hour than could be established by the scientific investigations of an army of scientists in half a century. Indeed, most of these notions have already been refuted by modern science or have nothing but vague, emotional, personal observations to support them. They are utterly fantastic. The conspicuous feature about them is that they all arise from those four fundamental habits of mind that cause nearly all the world's errors. Let us recall them for a moment: observing the exception to the rule, drawing general conclusions from particular instances, dislike for straight and hard thinking irrespective of tradition, and the desire to be important.

However, it is my good fortune to belong also to a number of clubs made up of scientists, and there the atmosphere is radically different. You hear little except the words, "measurement," "amounts," "degrees of difference," "variability," "coefficient of correlation," "ratios," "corrected data," "standard deviations," "least squares," "regression equations," "product moments," "reliability," "validity" and, perhaps most frequently of all, "probable error." I have to confess that I never heard this latter term in any writers' club, or state legislature, or the House of Representatives, or the United States Senate, or in any political meeting in all my life. It is only the few trained in science who know what "probable error" means or how to measure it. It was only when men learned how to note, check up and measure their own errors of thinking and analysis that any exact knowledge of nature became possible.

I think then, Manstreet, that even you will agree that correct thinking can never be achieved by any man, in any field that comes within the province of science, no matter how great an artist or writer or emotional leader he may be, as long as he retains the four mental habits, or any one of them, that I have enumerated. They all combine to produce a most remarkable phenomenon of the mind, namely, the "will to believe." In many situations of life requiring courage and decision, action, and movement, this is one of the most beneficial habits men can have. As William James pointed out repeatedly, when you are in a situation where the evidence for one course of conduct or one conclusion is as great as it is for the opposite course or conclusion, and some kind of action or belief is necessary, the part of human wisdom is to follow the course that gives you personally the greatest courage. There are occasions when for the time we should adopt beliefs and act on them, for which we can not furnish adequate evidence. In such cases the advice of James seems by all means to be the highest wisdom.

But in matters and issues that can be submitted to scientific analysis, the will to believe is the most destructive of all possible attitudes of the mind. You see the thing you want to see, you believe the thing you want to believe; and these four mental habits I have enumerated, when carried over into scientific issues and problems, create the will to believe in a world of mental activity, where it makes correct opinions impossible. Just so long, therefore, as you keep up those mental habits you are going to fool yourself and be fooled as well by every form and type of humbuggery.

And not only does humbuggery still exist, but as we shall see further along in these talks, even science itself is being used to increase and promote it. Humbuggery still exists in a thousand forms, all the way from blazing advertisements for renewing your youth by some kind of soap or lotion rubbed on the outside, or some patent medicine or gland product taken on the inside, to having your character read by the bumps on your head or the signs of the zodiac, having your money invested by the positions of the planets, having your life vocation determined by the skin on the palms of your hands and the time and manner of your death foretold by messages from another world. So long as you persist in these four mental habits you are going to be humbugged by character readers, astrologers, pseudopsychoanalysts, "applied" psychologists, ouija-board manipulators, economic and political panacea salesmen and hokum venders in general.

The aim of all critical thought and experimental investigation of nature is to give a man the background for a sound, helpful and constructive philosophy of life. As our recent genial guest, G. K. Chesterton, has pointed out, it is more important for a landlady to know her boarder's philosophy of life than to know his income; because after all it is a man's philosophy that determines his conduct. It is not some magic determinism but the boarder's philosophy, his philosophy about human relationships, home, parenthood, children, love, death, money, nature, character and God, that determines whether he will pay his keep or jump his board bill. It is a man's philosophy of life more than his technical skill that determines whether he is a good or a bad workman, a productive or unproductive salesman, an accurate or inaccurate accountant, a strong or a weak executive.

So long as a man lives his life under the dominance of mental habits which from necessity lead him constantly into error, and lead the world into error, the very foundations of a sound philosophy of life cannot be derived. They are just not there. Plato said, "Whether you want to be a philosopher or do not want to be a philosopher, you have to be a philosopher." And while science is only a part of life, a part of experience, a part of truth and consequently a part of the materials of philosophy, yet more than any other portion of man's experience the scientific way of using the mind is the most helpful mental habit men have discovered by which to form correct opinions in the world of natural law. More than any other single technique of the mental life it helps to make a man a good philosopher, instead of a poor philosopher, a wise philosopher instead of a foolish philosopher, a philosopher who is usually right, instead of a philosopher who is nearly always wrong.

As I have said, in the worlds of art and religion you may be a better philosopher, Manstreet, than I am, yet science is the only way in which men can derive those correct opinions about man and nature that enable them to accumulate knowledge and pass it on. The most inspiring thing about science is its passion to overcome its own ignorance. For this reason progress in science is the only kind of progress that is or can be accumulated. We can not begin in art where the Greeks or the old masters left off, but any bright schoolboy can begin in science where Cattell, Thorndike and Woodworth in psychology, or Michelson, Millikan and the two Comptons in physics, or Noyes, Langmuir and Lewis in chemistry, or Morgan, Wheeler and Jennings in biology, or Moore, Veblen and Dixon in mathematics, lay down their tools.

These men will soon all be gone. They and their colleagues ever since the days of the Greeks have enormously advanced the world in its fitness for great affairs, solely because they knew how to form correct opinions. And if we can only teach the schoolboys and girls their methods of forming correct opinions, I have no fear of the future. That new and informed generation will at least not use science as it is being used to an enormous extent to-day to promote humbuggery.

You subscribe, Manstreet, to the popular saying, "This is a free country, and everybody has a right to his own opinion." It is just this wrong opinion that more than anything else has kept us from becoming a free country. It is the most destructive of all popular notions. It still dominates our politics. Until recently it dominated our immigration policy. To-day it almost completely rules our international attitudes and prevents us from ascertaining by scientific methods the truth of the highly technical intricacies of international relationships. It invades our education and everywhere retards the progress of experimental education by placing even the training of our children under the domination of parties and politics.

You claim that you believe in the doctrine of Jesus, "The truth shall make you free." If you really believed this and acted on it, it would work the only revolution that we need: the revolution of applying the technical methods of science to finding out what the truths really are in business, politics, charity, philanthropy, economics, labor and wages, prohibition, religion and all manner of human activities and relationships.

It is this kind of revolution that is the goal of every laboratory of pure science in the world. It is this kind of revolution that is the goal of the great cooperative researches, now known as the "Institutes of Human Relations," which our universities are spending time, thought and money to establish. This is the most hopeful revolution on the human horizon to-day; but its effectiveness and the immediacy and beneficence of its results will depend in very large measure, Manstreet, on your giving up your foolish opinion that everybody has a right to his opinion. No one has a right to an opinion in the field of fact who has not pursued the critical methods of science and found out the truth for himself, or else has discovered the man who has found out the truth in this way and who is therefore the only safe guide to follow.

D. K.

Chapter IV

You are wrong if you believe

THAT THE OSTRICH HIDES ITS HEAD IN THE SAND

I SCARCELY know, Manstreet, what our political orators would do for figures of speech if it were not for our numerous popular fallacies. Since they are dealing largely in fallacies anyhow, it seems little short of providential that they should have so many fallacious notions of nature in which to express themselves.

One favorite figure of speech on which to impale one's opponent is to compare him to the ostrich. With great fervor the orator exclaims, "Like the ostrich, he is hiding his head in the sand. But, my friends, after all, he deceives no one but himself. His dire machinations are still perfectly obvious, and if they are not frustrated by your wisdom in electing me, they will bring the country to its downfall!"

Unfortunately for this impressive figure of speech, ostriches do not hide their heads in the sand, according to the best naturalists who have studied them in their native habitats.

There seems to be nothing more to say on this notion, Manstreet, except that I am sorry that you are wrong about it.

Chapter V

You are wrong if you believe

THAT YOU KNOW HOW TO WIN AN ARGUMENT

It is surely an astounding fact that people have been arguing with each other ever since Adam and Eve debated over the up-to-that-time unemployed apple and yet it never occurred to any one until recently even to try to find out by any sort of scientific or inductive method what are the fundamental psychological principles by which arguments are either lost or won. Think of it! Here is an outstanding phenomenon of every-day life: millions of people arguing with each other from morning to night, millions of salesmen trying to sell things, millions of teachers trying to convince students, millions of politicians and statesmen (at least it seems like millions) debating problems of national destiny. Furthermore nearly every one's personal success or failure is largely dependent on his ability to win his argument, to present his side of the case so that the other fellow will accept his point of view—something that is almost always forgotten in all arguments. Yet, as I say, until recently nobody has even tried to find out why some arguments fail and why some win, or what are the principles of successful argument—in other words no one has made any consistent endeavor to find out what all the noise is about.

Let us take an example, Manstreet, of the ordinary argument. Since it has occurred hundreds of times between you and your wife you will appreciate my trying situation. Perhaps, of course, wives ought to accept the opinions their husbands advance; but perhaps that is itself a wrong popular notion of our sex. At least the wives obviously think it is open to argument. I happened to look up from my paper the other evening, and remarked to Mrs. Wiggam what seemed to me to be an obvious truth:

"I see that women's skirts are to be much longer; I am glad that at last they are coming back to a little modesty."

I won't say that she exactly *snapped,* but I will say she *retorted,* "I don't think it is a question of modesty. Women are just as modest at one time of the world as another. It is a question of health and convenience."

"Well," I also retorted—maybe there was the least bit of edge on my voice—"if it is a question of health then why can't they decide just what is the best length for health, and be done with it? Women are willing to sacrifice their health any time for the sake of style."

"I think," she replied, just a little more sharply than before, "that women take just as good care of their health as men do. If we women did not take good care of our health, you men would find you had a hard job running things."

"As far as that is concerned," I shot back, I don't like to admit it, but I really believe I *almost* shot back, "statistics show that men can run houses just as well as women and better for that matter. Men have made nearly all the inventions for household conveniences, vacuum cleaners, electric stoves and the like that women use."

"That is not because women could not invent things if they wanted to or have any less brains than men." She was *almost* testy now, or seemed so to me. "Women have not been inventors because they had to spend so much of their time raising babies."

"They don't do much of that any more," I said. I won't exactly say that I snorted, but by this time I was growing very positive. "Back in mother's day she used to get up in the morning, even on Sundays, and get eight children ready to go to church by ten o'clock. We had church in those days. People cared a great deal more then about the things of religion than they do nowadays. Our youngsters are growing up without any religion at all. I think that is what makes them so disrespectful to us older folks."

All at once Mrs. Wiggam broke out into a ringing laugh. For a moment I was puzzled and a bit nettled.

"What's funny?" I asked.

"Why, both of us," she replied, still laughing. "We are both as funny as we can be. We started out to argue about short skirts, and then we got off on vacuum cleaners, and then on babies, and now it's religion! You would think we honestly expected to settle something. But you can't settle anything unless you stick to the point."

I was about to ask her how anybody could make her stick to the point, but I suddenly recalled that a friend of mine had told me a few days previous about two young men in New York University who had just finished extensive research on this very problem of how to win an argument. He said they had found some startlingly simple principles by which all successful arguments are won. The research showed that by neglect of these principles salesmen are constantly losing big sales, lawyers are losing pleas in court, and both friends and enemies are constantly hurling words back and forth at each other, thinking they are arguing when they are not doing anything of the sort. So I determined to go out to New York University and discover the secrets of successful argumentation that these young men had worked out. They might help me in arguing with my wife.

I found these two young men were Dr. Richard C. Borden and Dr. Alvin C. Busse of the Department of

Public Speaking and Debating of New York University. These two young professors of public speaking and debating, concluded some years ago that they were long on classroom theory but short on the first principles of hard-fisted argument, and determined to have a fling at the practical world of give-and-take. They wanted to listen to office arguments and sales talks, tea-table bickerings and smoking-car debates. So they boldly got down from their professorial chairs in New York University and stepped out into the world of rapid-fire talk, where they landed a succession of short-time jobs with numerous business firms throughout the country.

The professors kept their ears open. And they carried note-books. All that they heard and saw they took down in shorthand. In purchasing departments they heard high-powered salesmen present their arguments. In executive offices they observed how managers, superintendents and foremen argued out their problems. Out of office they made notes of almost every conceivable brand of argument: verbal battles over baseball, prize fights and politics; tenants tongue-lashing landlords; housewives bickering with butchers; taxi-drivers locking horns at the curb.

For seven years they listened and scribbled shorthand notes. All told, they took down more than twenty thousand sales talks and arguments. Out of this mass they sifted a number of definite and valuable conclusions as to what to do and what not to do to win an argument, to sell yourself, your goods or your ideas.

The upshot of this painstaking research was that these two professors are now consulted by men of large affairs as authorities on the science of effective salesmanship. In hundreds of commercial and industrial organizations they have wrought radical changes in methods of training salesmen and executives. Both are back again at their work in New York University, but they are also engaged in the every-day task of showing the rest of us how to "put over" ourselves and our ideas.

I spent a day with these two professors and had many subsequent talks with them, especially with Doctor Borden, and the following paragraphs embody the essence of what he told me:

We were truly surprised not to say actually embarrassed, when we discovered how simple the six basic principles of effective argument really are. They stick out like a sore thumb. The great salesmen and debaters have recognized and used them. All we have done has been merely to dig them out and try to state them clearly.

These six principles might be worded in many ways, but stated in very simple terms they are:

> (1) Don't try to do all the talking. Remember your opponent wants to talk just as badly as you do. Give the other fellow a chance.
>
> (2) Don't interrupt your opponent's talk with a counter-argument.
>
> (3) Do not assume an argumentative, dogmatic attitude. Don't wear boxing gloves.
>
> (4) Ask questions in a pleasant, inquiring tone of voice during the first half of the argument.
>
> (5) Restate clearly and fairly in a very few words of your own the gist of each argument your opponent advances *as soon as he advances it.*
>
> (6) When you reply, stick to the subject. *Bring out the key issue and stick to it.* Don't digress and don't let your opponent digress.

In explaining the application of these principles I wish to emphasize first of all that the only way you can get their full benefit is to paste them on your mental hat-band and use them *consciously, deliberately.* Most persons who use them at all apply them unconsciously. And most persons who violate them are unaware that they are doing so. If you do not practise them until they become a habit, you will forget and will not use them at all.

The chief trouble with many arguments is that they are never carried through to a conclusion. Either, one party violates Principle No. 1, and does all the talking, or as fast as one party advances an argument the other comes back with a counter-argument in violation of Principle No. 2. This almost always results in a violation of Principle No. 6, because it is almost sure to lead them off the subject.

I saw a good example of this last mistake the other day. The sales manager of an established house wanted to talk to the president about a plan he had worked out for changing the business from a cash to a credit instalment basis.

The president was one of those crusty hard-shells who cling to one idea like a bull pup to an old shoe.

"Now, Bill," he said to the sales manager, "you know my attitude on that subject. We've built up a big business by the cash policy. Still, if you have some real ideas, I can give you ten minutes, but only ten, because I have to leave for an appointment."

Bill started bravely. He had talked for about a minute when, by chance, he remarked, "The credit concerns are simply playing football with our sales records."

Instantly the president interrupted and said, "Well, Bill, speaking of football, did you see the game last Saturday? That boy of mine certainly made a name for himself and his college. Wasn't that a great run he made? Broke right through Waterford's center and made a touchdown."

Right there Bill lost his case, for instead of pleasantly remarking that it was a great run and the boy was a sure comer, and then *swinging the old man back to the key issue,* he said with enthusiasm, "That boy sure did clean up the field. Where the Waterford halfback made his mistake was——" and away they went on a discussion of football, about which each thought he knew the fine points. Suddenly the president jumped to his feet and exclaimed, "Great Scott! I'm late for that appointment now. Good-by, Bill, see me some other time about that credit business."

You see, Bill let the other fellow switch him off the track. You must constantly and consciously watch that in both yourself and the other fellow. You simply *must* bring out the key issue and stick to it. That is the hardest thing to get people to do.

Disputes between husbands and wives, lovers, and neighbors go on endlessly and often wind up with bitter personalities, more from the failure to agree on what they are arguing about than from anything else. This can nearly always be avoided if one party will just have the good sense to stop a minute and say good-naturedly, "Well, now, we've been talking quite a while, but let's see if we can't agree on the main question. Would you not say our main point of difference is so-and-so?"

It is impossible to over-emphasize the necessity of first discovering the key issue and holding to it. As an example of this one of the largest sales organizations in America employed us to discover for them the key issue in selling their memberships. Since this research was confidential I can only say that they had had their salesmen laying great stress for years on various services they rendered the individual. It seemed natural to think that people joined the organization chiefly because of what they would get out of it as individuals. But Doctor Busse and I, after taking down five thousand interviews by their salesmen and analyzing them, discovered that individual service was not their real key issue at all. People joined chiefly because of a *sense of patriotism.* When you joined this Association part of your membership fee went for public benefit for wiser legislation and general welfare. The salesman had only mentioned this point as a mere incidental, but we found it was the chief pulling power in selling their membership to the public.

So you see how tremendously important it is for a salesman or debater or for you when you are in a friendly argument to decide definitely what the key issue is. In the end you must stake your all on that and with a little practise you can form the habit of bringing out the key issue by questions you ask during the first half of the argument. Your first job is to keep it from becoming a heated discussion. In this the biggest help is *at the very first word* deliberately and quickly to put in practise Rule 4, which is to ask questions in a pleasant inquiring tone of voice, and Rule 5, which is to restate clearly and fairly the high point of each of your opponent's arguments *as he goes along.* This keeps everybody in good temper and prevents the argument from becoming a bout of mental fisticuffs.

Suppose that the next three times somebody jabs one of your pet notions, instead of firing back in an effort to land a solar plexus before he can put up his hands, you try saying cordially something like this: "I have often heard that objection (or argument, or proposition) advanced. Of course, every question has two sides. I wish, though, you would give me some of your main reasons for this point of view." And when he has done so, say, "That is the best statement of the point I have ever heard." This flatters him at the outset and opens the way for a really sensible discussion.

Perhaps I can give some idea of the correct principles of argument by considering a case where a wife is trying to persuade her husband that she should get a job. The other day a man killed his wife and himself because she wanted to get a job and help out on expenses. That is one way, of course! Suppose, however, John and Mary are newly married and settled in a nice home, and he has the old-fashioned notion that she ought to be satisfied to be merely a housekeeper, while she thinks she should get a job.

Of course, I have no wish here to set out a systematic set of reasons why married women should or should not be employed, but merely to illustrate the correct strategy of argumentation in general. In this case Mary has been in the habit, every time her husband has advanced an argument against her plan, of shooting back a counter-argument. He has been doing likewise. As a result both have become more set in their convictions; and both have become convinced that due weight is not given to their respective objections. "The trouble is you don't half pay attention to what I say." Both are sure to think this unless one of them shows, by repeating the other's arguments, that he clearly understands and values them.

You must learn to value objections or you will never effectually reply to them, with the result that your opponent goes away with them bottled inside of him tighter than ever.

Again, in this argument between John and Mary, heretofore the one who has taken the floor first has tried to do all the talking. Thus, Principle No. 1 goes to pot. Next, after John has gained the floor, Mary has always watched every chance to shoot in counter-arguments. This has only irritated him and has never done Mary's case a particle of good. No matter how strong and logical Mary's counter-arguments may be, John has been in no *mood* to accept them.

There is another bad result from Mary's shooting in her arguments at the wrong time. Suppose her main arguments are: that she is tired of being shut up in the house; that it doesn't require all of her time; that it is a woman's rightful duty to work and help her husband; that even married women have a right to be independent and have their own spending money; that in time they plan for children; and that they must save up money for the rainy day. All bully good arguments, but by throwing them in at the wrong time she has made John feel that here is a fine chance for him to assert his authority as head of the house. Nothing he enjoys more. Mary has been playing right into his hands.

Suppose, however, that some day when the old question comes up, and John is shooting off his usual standbys—namely, that woman's place is in the home, that he is getting a good enough salary, and that they don't need the money—suppose Mary says, not sarcastically, mind you, but with real cordiality in her voice, "Of course, we must consider that side of it, that a woman's place *is* in the home" (repeating his argument, you see, and showing him she values it). In that event she will have won the first skirmish—unless she spoils it all by adding, "*but* you fail to consider——" If she does, she will lose her whole case right there! John will instantly come back with his same old gags and Mary will get out her mental hatpin as usual and go to jabbing at him, and there you are!

If Mary is to win she must, from the start, remember to build her arguments around one key issue on which she proposes to stake her case. Suppose, for example, she has made up her mind that the issue around which she can best build the other arguments is that while they don't need the money now, they will need it for the rainy day, for the future children, for buying the home so that they can quit renting, for sickness, and all that. She can get off to the best start if, instead of firing right back the moment John mentions the money question, she admits that he is doing splendidly and that they have enough for all present needs, and then encourages him by her questions to bring out all his other arguments, carefully leading toward her key issue.

John is surprised and gratified that Mary is willing at last to consider his points of view. Neither is irritated nor ready to put on the gloves. Mary has shown that she understands all John's objections and appreciates them. This gives Mary the distinct advantage that it forces John to receive her arguments in the same spirit.

Soon John will have reached the end of his ammunition because Mary has carefully refrained from getting him off the track. When this point is reached, it is up to Mary to marshal her arguments for her side with her key issue always before her mind; namely, the rainy day. By her questions Mary has induced John to admit that the rainy-day argument is important. She must now use all her skill to show that it is *the* most important thing they must consider. She is in a position to appeal to his sympathy, affection and imagination. She can now safely use the word "but." She can say effectively that his arguments do have great weight, as she has admitted, but she believes they should also consider that while John is doing well now, yet sickness may come. Even if it does not, the sooner they get their nest-egg laid up, the more years they will have to take it easy together.

All the time she must stick fast to the key issue. If she lets John swing back to any of his old arguments—the woman's-place-in-the-home argument or any of the others—she is a loser. The moment he brings that up, she must say pleasantly, "Yes, dear, I admitted the importance of that; you see, it is just because I do so want a permanent home where I can always stay contentedly that I am so eager to earn some extra money," and then go right on with the key issue.

You must watch him like a hawk here, Mary. Don't let him get off the track. You must win on this issue or else surrender.

Successful arguments and successful sales without exception have this definite, logical structure. Like a drama, they must follow definite rules, they must have their high spots and climaxes in the proper places, or else the grand finale will not be achieved.

I know these principles may seem almost ridiculously simple and easy, but, nevertheless, you have to think of them deliberately until you get the habit. It is so easy to overlook one or more of them and lose a big sale or a job, or even a husband or wife or sweetheart.

I imagine, Manstreet, that these principles may seem ridiculously simple and easy. Nevertheless, they have escaped practically all logicians, unless perhaps it was Socrates. I know I did not find them when I studied books on logic in college. I recall we had a textbook on logic written by some fellow named, I think, Jevons, or Archbishop Whately, or some such disputatious person. I see my encyclopedia states that Whately's work on logic is "well-known." Not to me—although I studied it industriously! Whoever wrote the book lugged in a lot of quotations from Kant and Hume and Aristotle and I don't know who all. But not a single one of these men with their great intellects ever got down from his professorial dignity and went out with a shorthand note-book and took down actual arguments by the thousand with a view to seeing what kind of arguments win and what kind lose. In other words, they did not take the inductive, scientific method, although they talked learnedly about this method. If they ever practised it I for one failed to become aware of it.

I think, therefore, this research has prime importance to every human being, because most of us spend our lives in some form of argument, an enormous portion of which is worse than useless. It is another example of the effectiveness of applying science to life, applying science to our daily walk and talk. And I have found by endeavoring to put its principles into practise when arguing with my friends, or with an audience from the platform, or with my wife, that it is an enormous aid to one of the finest things in human nature, namely, tolerance.

CHAPTER VI

You are wrong if you believe

THAT YOU CAN MAKE A PERSON TURN AROUND BY GAZING AT THE BACK OF HIS HEAD

LORD ARTHUR BALFOUR is reported to have said that to him the most amazing thing in the world is that you can make a person in front of you turn about by looking intently at the back of his head. The only amazing thing about this is that it can't be done, notwithstanding this great Englishman's reported opinion. Numerous experiments have been tried under controlled conditions, and they always have ended in failure. In one experiment at Stanford twelve persons were placed in a group in order to combine the effect of their stares, but to no purpose; the persons gazed at, who were entirely ignorant of the fact that they were the objects of such intense scrutiny, just refused to turn around. It may be objected that these gazers were not "psychics" and, therefore, were not endowed with powers of mind-reading. But a number of experiments were tried where so-called "psychics" did the staring, yet they succeeded no better than ordinary mundane people. Of course people often say they have a feeling that some one behind is looking at them and on turning about find this to be the case. But we nearly always look at the people in front of us. This sort of "proof" is merely childish. Indeed the whole notion is childish, and I am sorry, Manstreet, that you should be wrong about it.

CHAPTER VII

You are wrong if you believe

THAT BRILLIANT SCHOLARS DO NOT SUCCEED IN BUSINESS

"DON'T go to college if you would succeed in business."

According to an interview by Dorothy Roe, sent out on March 12, 1931, by *The Universal News Service*, and reproduced here by their permission, this is the advice given by Thomas A. Buckner, who began his business career fifty-one years ago as an office boy in the New York Life Insurance Company, and on the day previous to this interview was elected the eighth president of the Company.

Mr. Buckner, who is described as a "kindly, rotund man of sixty-six, with two hobbies, his family and his golf," is reported to have continued as follows:

> "The boy who starts as an office boy is efficient, ambitious, keeps his eyes and ears open, has by far the greatest chance of success. The college graduate who comes into our firm usually feels that he is too good to begin at the bottom. He wants advancement too quickly. But the boy who comes to us in his early teens and works as an office boy has a chance to learn the workings of big business more thoroughly than he could in any college."

Another interview, by Harold Heroux, special correspondent of *The International News Service*, sent out on March 20, 1931, purports to give the views of Captain Robert Dollar, who is described as "the active white-haired dean of American shipping men." The interview was said to be in honor of Mr. Dollar's eighty-seventh birthday. Mr. Dollar is reported to have made the following penetrating remarks about education:

> "Higher education is a waste of time. Go to work when you are sixteen years old. Forget higher education and college training. The one who starts at the bottom of the ladder early has the best chance to climb to the top."

If Mr. Buckner and Captain Dollar are correctly reported, it is obvious that while they may know life insurance and the shipping business better than any men living, they clearly do not know either the "workings of big business" in general or the workings of American education. If they are correctly quoted, their remarks are only further illustrations of the tendency of many big business men to belittle higher education for business success, and at the same time to show an amazing ignorance of the broad impartial investigations which have been made as to the effect of both high scholarship and higher education—including high school and college—upon success in business. It may be, of course, as Mr. Buckner's reported remarks intimate, that ignorant, uncultivated men—men ignorant of history, literature, art, science and even economics—may succeed best in selling life insurance. I believe the large number of college men who are successful in life insurance—with a large group of whom I sat recently in New York University where they were studying advanced courses in the psychology of salesmanship—will resent this imputation. But if it is true, and if these general facts are true also in the shipping business, then these two lines are outside the general trend of modern big business in its relation to education.

Some forty thousand students are graduated by the colleges of the country every June, and many of them at once begin their business careers. So it seems eminently appropriate to study this type of advice and to determine how valuable it is and how much truth it holds.

Since I feel strongly that such remarks as those I have quoted do grave injustice to American education and may do irreparable damage to the life careers of many young men who believe that all utterances coming from such sources must be one hundred per cent. true, I shall endeavor to show that they are at least seventy-five per cent. untrue.

To do this I shall set forth investigations in four fields of education and business: first, the effect of high scholarship on business success; second, the comparative effects of eighth-grade, high-school and college graduation on business success; third, the effect of both high scholarship and other college successes on business success. These three studies represent almost exclusively the careers of men. Then I shall set forth the facts bearing upon the education of women and their relative success in business as determined by a number of extended researches*.

I think I can best introduce the first investigation by a simple but dramatic story.

One day, not long since, a college professor and a committee of "Old Grads" were going over the records of eighteen hundred of the graduates of one of our great universities to find how the "old boys" were succeeding in life. They wished especially to learn whether the high-mark men in college were making the high marks in life, or whether the low-mark men were the ones who had in the main achieved worldly fame and fortune. By and by they came to one man who gave as his occupation "selling chicken wire fence in a small town." This is certainly a respectable occupation, but not one usually contemplated as the chief objective of a college curriculum. One member of the Old Grad committee, who evidently had not lost his sporting blood, offered to bet one hundred to one that if they would look up this man's college grades they would find them to average below eighty-seven. Neither the professor nor any member of the committee would take the bet. Yet I feel pretty certain that ninety-five business men out of a hundred throughout the United States would have taken the bet, not only at one hundred to one, but at one to one. If they had they would have lost at any odds, because when they looked up this man's grades they found them to average below eighty-three.

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*See Bibliography at close of chapter.

Now the reason I say business men generally would have taken this bet without hesitation is because there is an almost universal belief among the business public that the brilliant scholar in college is usually a failure in the business world. He is believed to be "impractical," "a dreamer," a man with his head full of theories and highfalutin' ideas, and almost certain to be a failure as a high-powered salesman, a production manager, a judge of securities or as any type of executive.

I know this personally from having lectured to hundreds of Chambers of Commerce, Executive Clubs, Salesmen's Conventions and the like throughout the country. Moreover, we see this opinion constantly and confidently voiced by many of America's leading business men. We see also the converse opinion just as confidently expressed—namely, that the men who are low or who fail in their college studies but who are leaders in college riots and daredevil pranks or in athletics, or are among the champion dancers and ladies' men of the campus, and who bluff their way over the prostrate forms of the professors and deans, are the ones whom we usually find in after-life fighting the big legal battles or holding down important jobs as presidents of big corporations and managers of the country's general destinies.

On the other hand, the reason why no member of this committee would risk his money on the foregoing bet, even at one hundred to one, was because he knew too much about it. It was because this committee and this professor, Dr. Hugh A. Smith, now of the University of Wisconsin, had been engaged in a two-year research to find just how the good, bad and mediocre students in this list of eighteen hundred had really turned out. I must confess that while all my own studies have confirmed my belief that high scholarship, high intelligence, high character, high personal qualities and high success in life all tend to a considerable degree to go together, I was truly astounded at the results of this study. A great deal of the data has not been published, but Mr. Smith has given me, from a technical monograph, some of his main conclusions. To use the common parlance, they knock into a cocked hat the notion that the college prodigy and the brilliant student are likely to fail in practical life and that the dull student is the one more likely to succeed.

What Professor Smith did was to take all the graduates of the university, numbering eighteen hundred, who had been out in life from fifteen to forty-five years, study their worldly success and then compare this with their college records. In order to be fair in deciding what should be called "success," Doctor Smith asked committees of the various classes of bygone years to give their frank opinions on the post-college careers of their old classmates. He also secured the opinions of numerous other persons acquainted with these careers.

Doubtless some of the judges laid emphasis on intellectual or literary or professional achievement, some on eminence as a citizen and some on money and other things. As a result, therefore, a composite, well-balanced judgment of the success of each man was reached. They then compared these rankings of worldly success with the rankings that their college teachers had given them all the way from fifteen to forty-five years ago. How did the two gradings—the college grading and the worldly grading—agree?

The agreement was almost unbelievable. As Professor Smith says: "If a man was high in one list, he was almost invariably high in the other; and if low in one, low in the other. This situation was repeated with such monotony that the temptation became strong when one factor was known to accept it as a certain indication of the other. If, for example, the college record of student No. 500 happened to be misplaced, but the information showed that he had clearly won no distinction in life, it hardly seemed worth while to search for the missing record. Experience with hundreds of others made it sure he would be classed with ninety-nine per cent. of certainty in the group with low marks. On the other hand, if a man had had a grade in college of ninety-three or better, it seemed almost superfluous to consult records and write letters in order to learn that he held a position of importance or eminence."

As an example of this, in one class of fifty-four graduates nine were judged by this jury of their fellow men to have achieved true worldly success. Six of these men had grades above ninety-one and two had eighty-nine. Only the remaining one had a grade as low as eighty-five. In another class of seventy-five members eleven were nominated for high worldly rank. Ten of the eleven had been the first ten in scholarship in college. The eleventh had a mark of only eighty-five, being one of the few exceptions to the rule. And it is rather discouraging for America's future to find that this man and also most of the other low-grade men who did attain eminence were politicians! As Professor Smith remarks: "It does not seem certain that a high college record is an asset in getting votes."

But the most striking thing was that a separate list was made up of the ninety-seven who were considered "the most worthy, successful or eminent." Another list was made up of the ninety-three who had the highest grades. The astonishing thing is that these two lists contained eighty-seven names in common!

Professor Smith made another comparison between college grades and election to *Who's Who in America.* He took three of the earlier classes, numbering ninety-three members, counting both men and women, and selected the twelve with the highest college records. Nine of these twelve were in *Who's Who,* while only one out of the eighty-one remaining members with lower records were in *Who's Who.* Since few women are elected to *Who's Who,* he took a list of two hundred men from the five classes about midway in age and found, among the twenty-eight high-mark men, eighteen who were in *Who's Who.* Only two of the remaining one hundred and seventy-two low-mark men were in *Who's Who.* Combining the two groups just mentioned, we see that out of the forty high-mark students twenty-seven are listed in *Who's Who,* while among the two hundred and fifty-three low-mark students only three are found in *Who's Who.*

This study makes it obvious that when, over a period of four years, some twenty or thirty college professors and several deans mark a man with high grades for intellectual achievement, industry and general soundness of character—which makes a sum total of about two thousand recorded gradings by men who are themselves men of intelligence and character—it gives a pretty clear indication of what the world may expect of that young man in the way of worldly achievement. College professors are not very different in their judgments of human nature from business men. As one philosopher said, "College does not make fools, it develops them." Neither does it make wise men; but it gives the fool his chance, and it gives the studious, industrious, sound-hearted boy and girl their chance to show what they are made of, and the world of business by and by gives them just about the same relative chance and accepts them pretty much at their own price.

However, the foregoing is only one of a number of remarkable studies that have been published recently on the relationship between scholarship and practical success in life. The second investigation to be presented deals with eighth-grade, high-school and college graduation and worldly success. This involves a primary question of the first importance—namely, "Does education pay at all?"

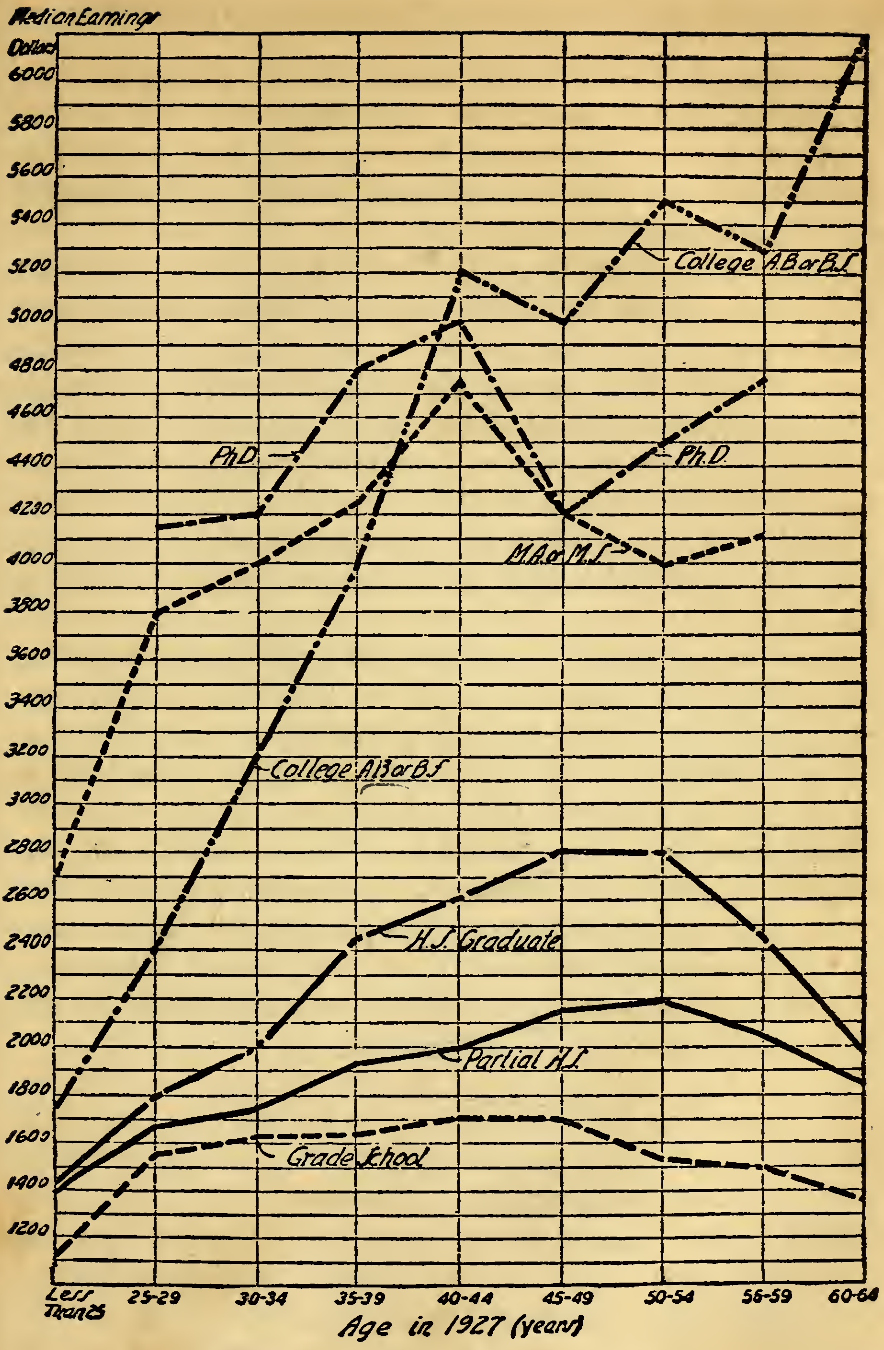
The most notable study of this question has recently been made by Dean Everett W. Lord, of Boston University. He studied the records of about five thousand men, ranging in age from nineteen to seventy-two years, living in all parts of the United States and including bankers and bakers, clerks and clergymen, merchants and mechanics, actors and doctors, teachers and accountants. Certainly this gives us a cross-section of American business. What gives it even greater authority is that a large part of the data was collected through the Alpha Kappa Psi fraternity—a fraternity of business men.

The story is dramatically told in the chart on page 61. At the left of the chart you will see the incomes, and at the bottom the ages of these men. You see there is a steady rise in starting income from the eighth-grade graduates through the college graduates to the Doctors of Philosophy. One striking thing may escape your notice. That is that the grade-school man reaches the high point of his earnings at forty to forty-four years of age, while partial high-school and full high-school graduates reach their peaks around forty-five and carry on at about the same level to fifty-five, then they sharply decline. But notice that the income of the college graduate keeps on rising (with a few slight temporary declines) until he is at least sixty-four years old. The Masters of Arts and Doctors of Philosophy reach their peaks at forty to forty-five, but Dean Lord believes this is probably because most of them go into teaching, which is not so well paid as business.

The difference in the peaks of the grade-school men and the college graduates is amazing.

It is a temptation to detail a large number of the remarkable findings of Dean Lord's able and impartial research, but in sending me his tables and figures the dean himself has marked a few items in red ink which I should cite because of their importance to the young men of America.

Some of these items are as follows: It costs about eighty dollars a year for the state and nation to give a boy the first eight grades of schooling, but this expenditure, as nearly as can be estimated, adds about one thousand dollars a year to the boy's income for the next forty-one years over the income earned by illiterates. It costs about three hundred dollars a year for four years to give a boy a high-school education, but he earns about five hundred dollars a year more than the eighth-grade boy for the next forty years. It costs



How Much Education Pays a Man.

Each perpendicular line represents a five-year period after graduation; each horizontal line represents an increase of one hundred dollars in salary.

a young man about one thousand dollars a year for four years to secure a college education, but the college graduate earns approximately one thousand eight hundred dollars a year more than the high-school graduate for the next forty years.

Of course, the college graduate as a rule is an abler man than either the high-school or eighth-grade graduate—something most business men overlook—yet recent surveys have shown that a large number of young men of high-school ability drop out of school at the end of the eighth grade, and a great many young men of college ability stop their schooling at the end of high-school. So it is evident that a great many young people have not yet fully realized the money value of education.

Another point of great interest is that large numbers of eighth-grade and high-school graduates have subsequently taken correspondence courses or attended so-called "business colleges." All these show uniformly higher earnings than those who do not secure this additional training. Dean Lord also brings out the striking value of a genuine course in the newer schools of business administration which many colleges have instituted, beginning with the Wharton School of Finance of the University of Pennsylvania in 1881 and the College of Commerce of the University of California in 1898.

The earnings of the graduates from these higher institutions who received the degree of Bachelor of Business Administration and Bachelor of Commercial Science run far above those of the Bachelors of Arts and Bachelors of Science. Dean Lord shows that the average lifetime earnings of a B.B.A or B.C.S are now probably more than one hundred thousand dollars greater than those of the average college graduate. However, as time goes on and larger numbers of young men take these courses and the competition becomes keener, some of this difference doubtless will disappear.

In fact, just at this moment Dr. Paul S. Achilles, executive secretary of the Psychological Corporation of America, has called me on the telephone and sent me proofs of a new study in this field—indeed, the whole field of education in its relations to business—entitled *University Education for Business,* by Dr. James H. S. Bossard, professor of sociology, and Dr. J. Frederick Dewhurst, professor of industry, at the Wharton School. It is a work of extraordinary importance to all American business life. But the feature of interest at this moment is that the median earnings of 1,659 Wharton graduates in 1930 was $3,730. This includes all ages and years of experience, and is nearly treble the similar figure for Dean Lord's eighth-grade men, and one and a half times greater than his high-school men.

Furthermore, this able and most valuable study discloses the fact that the median earnings of men who have been out of Wharton fifteen or sixteen years is seventy-eight hundred dollars, while the median earnings of those graduating in 1911-'13 is twelve thousand dollars. Forty per cent. of the men graduating in 1917-'18 are already earning over nine thousand dollars and twenty-two per cent. are earning over twelve thousand dollars. May I ask where are the bright, ambitious office boys who started business life in 1918 or even six years earlier, compared with these men in point of income? Forty-one per cent. of the 1928 graduates are already earning more than two thousand dollars and twenty-one per cent. more than three thousand dollars. It would be interesting to learn what percentage of office boys who kept their eyes and ears open during the four years these boys were in college and two years thereafter are earning more than three thousand dollars a year.

Coming now to the third series of investigations, again dealing with the question of whether high-mark college men earn more than low-mark men and, still further, whether success in general college and campus activities outside the courses of study indicates future business success, two remarkable investigations have been made on the men in the Bell Telephone System—one by Dr. Walter S. Gifford, president of the American Telephone and Telegraph Company, and the other by Donald S. Bridgman, of the personnel department of the American Telephone and Telegraph Company. President Gifford published his study in 1928, and the results have attracted wide attention. The Bell System is the largest corporation in the world, and if it finds it worth while to pay higher salaries to brilliant college students, it certainly shatters the stubborn myth that the college prodigy peters out in business life and at the age of fifty or sixty is discovered as a minor college instructor, sub-editor of a small magazine or running an ice-cream parlor.

President Gifford studied the salary and scholarship records of 3,806 college men in the Bell System by dividing them into four grades, as to scholarship, as follows:

1. Those graduating in the first tenth of their class;
2. Those graduating in the first third but not the first tenth;
3. Those graduating in the middle third of their class;
4. Those graduating in the lower third of their class.

How have these men fared as to salaries in the Bell System? The results are all in favor of the brilliant college scholar as a success in business. After five years of employment, the upper tenth scholars began to earn more than the other college men. As President Gifford says: "These men continued to increase their advantage little by little, until they were twenty-five years out of college. Then they began to go ahead still more rapidly. . . . Many individuals did better, and many poorer than the medium man of the group, but the group as a whole averaged substantially higher earnings than the rest of the 3,800 men."

Taking next the 1,468 men who graduated in the middle third of their classes, after thirty years out of college their median earnings were less than two-thirds as much as the median earnings of those in the first tenth of their classes. The earnings of the 784 men in the lowest third of their classes trend in the opposite direction from those in the upper ten: that is, the longer the best students are in business the more rapidly their earnings rise, while the longer the poorer students are in business the slower their earnings rise. It must be remembered that there were individual men who were striking exceptions to these general rules.

Stimulated by this research and the enormous public interest it aroused, Mr. Bridgman made a further study of various college achievements other than scholarship and their relation to subsequent success with the Bell Telephone System. Bridgman's object was to see if other things besides a man's scholarship in college were related to his future business success. For this purpose he classified the 3,806 men of President Gifford's study into three groups:

1. Those with "substantial campus achievements," including editor-in-chief of a magazine, winner of an important oratorical contest or member of a debating team, manager of a major team or important student newspaper, major class officer or member of an honorary senior society, or leader of a dramatic or musical club;

2. "Some campus achievement," including member editorial board of a magazine, manager of a minor team or magazine, minor class officer or member of social fraternity, member of minor athletic team or of a major varsity squad;

3. "No campus achievement"—just a plain two-legged student.

It is impossible to go into all the technical details of this important study, especially the combinations of several factors in relation to future success. Taking, however, the man with "substantial college achievement" it is clear that the men who went in for public speaking and debating and the ones who ranked high for literary effort in the editorial field are the ones who are now drawing the highest median salaries in the Bell Telephone System.

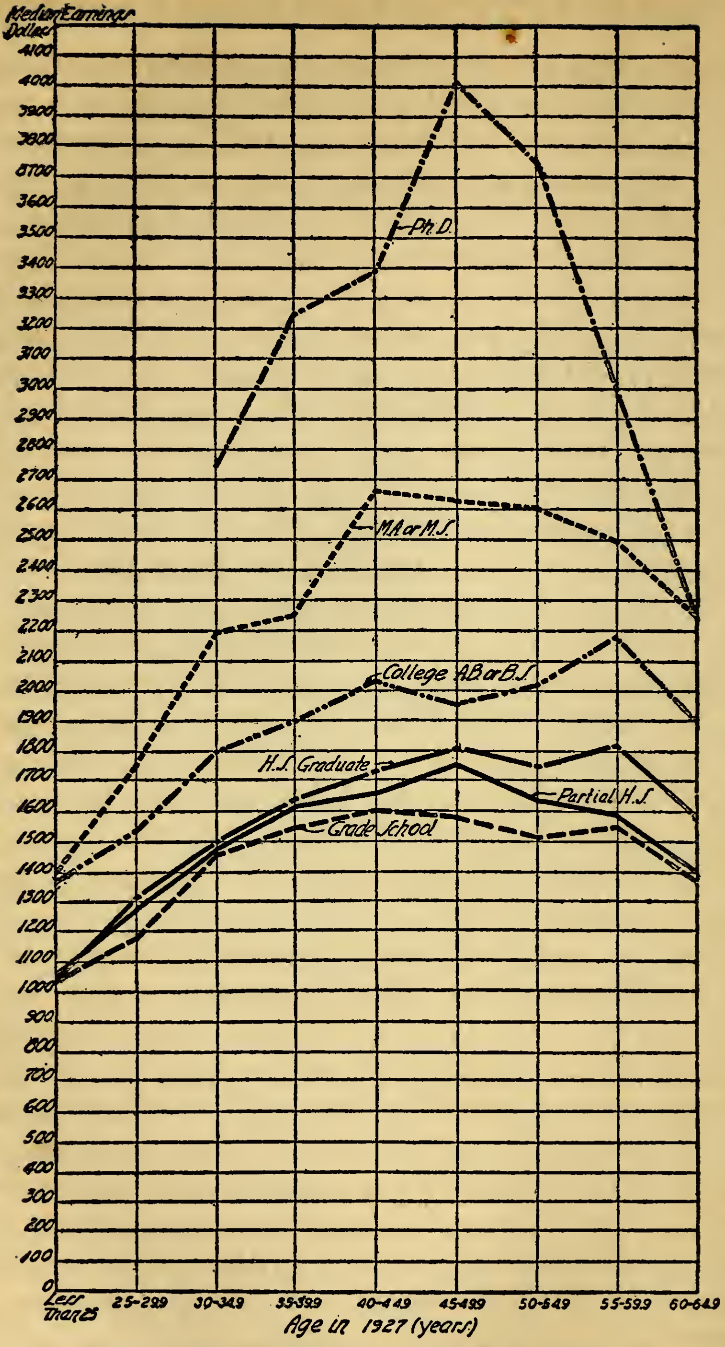
These types of campus achievement foreshadowed future business success almost as well as high college grades. No doubt most of these men had high grades. Next in order of subsequent success come the managers of major teams or important student newspapers. Next come those with social achievements such as major class officer or member of an honorary senior society. Next to these come those who made athletic achievements, and lastly, those who were leaders of dramatic or musical clubs.

Working one's way through college has always been assumed to indicate future success. It has been lauded as giving a man grit, determination and the work habit which would carry him up in the world. In Mr. Bridgman's study this factor had no significance. The men who earned their expenses in college had been equally successful, but no more so than the men who went through on flowery beds of ease. However, early graduation from college was found to be an index to some extent of future business and professional success.

I have purposely left for separate consideration the question of the value of education for women. Certainly one of the most important questions in the life of every ambitious woman as well as in the life of the nation is this: *Does education pay a woman in dollars and cents?*

In order to answer this question, the Bureau of Business Research of the University of Michigan and the National Federation of Business and Professional Women's Clubs, with headquarters in New York City, have just finished a large cooperative research on which these two highly efficient organizations have been engaged for more than four years. This research at last furnishes the data by which the question can be answered with great conciseness and authority. Over fourteen thousand salaried women, ranging from the lowest paid stenographers and sales clerks up to women earning twenty-five thousand dollars or more a year, performed the remarkable service of answering an eight-page questionnaire in which they gave confidential information covering their entire working lives—their earnings, years of experience, marital status, number of dependents, mode of living, amount of savings, number of promotions and changes of jobs, and the amount and quality of education they have received. The analysis of the answers given in these fourteen thousand eight-page histories of women has brought out facts of extraordinary interest to every business woman, and to every young woman in school who expects to enter on a business career.

One of the most surprising discoveries of the study was that women who leave school at the end of the eighth grade earn almost as much for their first twenty years as do women who take a partial or full high-school course, or who attend a normal school, or who take even one, two or three years of college.



HOW MUCH EDUCATION PAYS A WOMAN.

Each line represents the median earnings of women with various degrees of education. At the left will be seen the median earnings and at the bottom the earnings at each age period. Each cross-line represents one hundred dollars a year added earnings.

For the first twenty years the difference in median earnings runs around one hundred dollars a year in favor of the better educated woman. Of course this far more than pays for the extra education, but it is not spectacular. Beyond question a large part of this is due to the fact that so many educated women go into teaching, notoriously a poorly paid profession.

However, this unexpected discovery has some unexpected qualifications. One striking thing is that the eighth-grade woman reaches the peak of her earnings sooner than the better educated woman. She reaches her high point at forty and forty-five years of age, and then begins to decline, whereas the better educated women do not reach their peak until between forty-five and fifty years of age. Furthermore, these women continue almost on a level until very nearly the sixtieth year, whereas the eighth-grade woman steadily declines after forty-five. Of course, I am speaking of averages and medians. No doubt a few able eighth-grade women may increase their earnings beyond sixty years of age, but obviously as a rule the woman who has the better education to begin with earns more in her advanced years.

When we come to the woman college graduate we get a distinct jump throughout her entire working years. She starts about two hundred and fifty dollars better as a rule, and at the age of fifty-five to sixty is earning about three hundred and twenty-five dollars more a year than the high-school graduate and over six hundred dollars more than the eighth-grade woman. This is much more striking when we reflect that fully one-half of all college women graduates go into teaching which is poorly paid when compared with business, especially in the Eastern States.

It is in the big cities with their bigger opportunities that college women succeed the best. The woman college graduate who remains in the small town exceeds the woman with grade-school education by only three hundred dollars a year, whereas in cities of a quarter of a million or more she exceeds her by more than six hundred dollars. Indeed *wherever college women have ventured they have succeeded and succeeded better than any other women.* Not only do they succeed better as a rule, but in every field of work the woman college graduate is earning more than the less educated woman in spite of the fact that she has four years less experience than the high-school graduate and eight years less than the woman whose education ceased at the eighth grade.

At this point the research extends to college women two indications of great significance. The first, as just shown, is that other factors being equal they do better in the big cities with the big jobs. The second is that two-thirds of all college women are either in teaching or clerical work, and these two fields are the lowest paid among occupations at the college level. Not only are median earnings low in these lines but cases of high earnings are very rare.

For example only one college woman out of sixteen in clerical work and teaching earns three thousand dollars a year, whereas nearly forty per cent. of women college graduates in production and health work and nearly thirty per cent. in the selling fields and in finance earn this amount or more. It seems clear that college women are missing some very profitable fields.

When we consider these two important revelations as to the earnings of college women, first, that they do their best and outdo all other women where there are big openings, and second, that they are not going as much as they easily could into the higher paid occupations, it would seem that both college deans and women college graduates should give these facts earnest consideration. The facts will not apply to all individuals. Many college women either have to or prefer to remain in smaller towns. Many prefer the high spiritual and social rewards of teaching. Other women prefer the emotional satisfactions of welfare work and the like. But where the financial rewards are important, as they usually are, these facts should receive earnest consideration by every college woman choosing a career.

There are two other phases of education and earnings of great importance which the research studied. One is the money value of advanced degrees. This can be covered by the single statement that women with degrees of Master of Arts or Doctor of Philosophy have higher median earnings than any other women. Their advantage is very significant. The numbers were not great enough to warrant broad conclusions. However, another study of 100 Ph.Ds. of Radcliffe College, made in 1928 and sent to me in manuscript, found their median earnings to be $2,900 a year and that of 400 women with the degree of Master of Arts to be $2,500 a year. The median earnings of seven hundred and twenty-two A.B. graduates of Radcliffe was $2,000. In this connection Miss Katharine Doty, Director of the Occupation Bureau of Barnard College, of Columbia University, has kindly lent me some unpublished figures relative to the earnings in general of Barnard College A.B. graduates. The median earnings of 1300 women graduates for 1930 was $2,548. Of this group the teachers, school principals and deans earned a median of $2,622 and a maximum of $12,000, while those in business and the professions earned a median of $2,476, with one woman reporting earnings of $25,000. These earnings, all showing distinctly high medians for college women, are all closely in accord with the findings of the Michigan University Research.

One final phase of education I have yet to mention—special business and commercial training. As might be expected the women who benefit the most are the women with the least education. Of course some people advocate that all women should learn bookkeeping, typing and stenography. This may be excellent advice except for women college graduates who have not previously had such training. The research shows that college women who go into clerical or secretarial work earn less than college women in other occupations. No doubt they make better secretaries than eighth-grade or high-school women but for this very reason they probably always remain as secretaries. That is, college women who take up secretarial work with the hope of being promoted into the field of advertising or sales or publishing or to executive positions often find *their very excellence as secretaries blocks further promotion.* Many women regard office and secretarial work as ideal in itself, but as this research advises, college women who plan to rise in business may often find some other approach more direct and fruitful.

If we could compare the revelations of the research cited as to women's earnings with what a similar research would have revealed twenty-five or fifty years ago, the picture would beyond question be exceedingly encouraging. It seems certain that the position of women in American business is steadily, although slowly, improving. Since women have been highly instrumental in bringing about this improvement, the future also is to a great extent in their own hands. It seems evident that woman has three great instruments for improving her position in the business world. The first is organization under such leadership as that of the National Federation of Business and Professional Women's Clubs; the second is found in researches, such as those here reported, made in order to keep a constant check upon all the factors affecting her advance; and the third, which is bound to become increasingly important, is education.

In all these studies of both men and women there are too many individual exceptions for any young man or woman to conclude that we have unearthed a set of ironclad rules or sure-fire prophecies of future failure or success. In fact there is one study that has just reached me in manuscript form that is apparently not in harmony with the findings of the researches reported for men. This is a study made by Drs. G. C. Brandenburg and H. H. Remmers of the Department of Education and Psychology of Purdue University. It covers the careers of the Purdue graduates for the years 1919-1923, including a total of one hundred and fifty-two.

The investigation bears the stamp of high technical refinement and cautious conclusions. These authors find no relationship between either the scholastic grades or the intelligence scores of the one hundred and fifty-two students, and their financial success during the five years following graduation. The study is not altogether in contradiction with those already described, since the chief increases for both men and women have been shown to take place all the way from five to twenty years after graduation. This is peculiarly true of the studies of the men of the higher grades.

Of course one can think of no reason why Purdue graduates would be any different from the graduates of any other first-class institution. But Doctors Brandenburg and Remmers make the much-needed observation that it is quite possible that a very large part of the college curriculum is of little or no value simply because it is not related to a man's subsequent needs in life. The Schools of Business Administration make such an excellent showing for their graduates that it would seem to reenforce this suggestion. Certainly all the investigations with the exception of this last one are strongly in favor of the fact, first, that college education pays those who have the intelligence and drive to carry it through; and second, that it pays the brilliant student on the average considerably more in the long run of the years than it does the poor student. And even though the Purdue study shows no significant relationship between scholastic grades and future success during the first five years, which is likewise indicated by all the other studies, yet the Purdue research does show a distinct relationship between personality ratings and future success. Those with high personality ratings make a much better showing in business than those with low ratings for personal qualities. It is likewise rather widely believed among educators that our personal qualities, summed up in the rather vague term, personality, can be even more readily and extensively expanded by cultivation than the functions of the intellect.

These studies, in any way they may be interpreted, need not discourage any one and should be highly encouraging to students who want to study. Enough men who did poorly in college have risen high in worldly success to prove that no young man—or young woman either—who has not ranked high in college should conclude that he has little or no chance of high success. Very often by industry and courage, and by *finding his own line of best development,* he surpasses the men whose college achievements both in scholarship and on the campus were more spectacular. Furthermore the man with high college achievements finds no warrant here for lying back on his laurels and thinking he has a rosy path to success. But what these studies do prove is that the business world taken as a whole is looking for brains and character, and that the more education a man has the greater are his chances of financial success. They show further that the American college and university give the American youth a very excellent chance to show the fundamental stuff out of which he is made and that every field of modern work and achievement is calling loudly for the finest and richest human material.

NOTE: Those who wish to consult the original data of this review can do so as follows:

1. "College Records and Success in Life," Hugh A. Smith, Department of Romance Languages, University of Wisconsin, reprinted from *Education* for May, 1927.
2. "The Relation of Education and Income," by Everett Dean Lord of Boston University, published by the Alpha Kappa Psi Fraternity, 1050 North Delaware Street, Indianapolis, 1928.
3. *University Education for Business*, by James H. S. Bossard, Professor of Sociology and J. Frederic Dewhurst, Professor of Industry, Wharton School of Commerce, University of Pennsylvania, Chapters VII and VIII, 1931.
4. "Does Business Want Scholars," by Walter S. Gifford, *Harper's Magazine*, May, 1928.
5. "Success in College and Business," Donald S. Bridgman, American Telephone and Telegraph Company, *The Personnel Journal*, June, 1930.
6. "Earnings of Women in Business and the Professions," can be procured in paper binding from the University of Michigan School of Business Administration. It is Vol. 3, No. 1, September, 1930, in the series of *Michigan Business Studies*, by Margaret Elliott, and Grace E. Manson. Price $1.00. The diagram (page 68) showing the earnings of women in business is reprinted from this research by permission. The chart showing the relation of education and income for men (page 61) is reprinted from the Michigan Study, but is practically a reproduction of a similar chart in Dean Lord's study and represents his figures. The chart for women is from the Michigan Study made up from their own data.
7. A study of "The Relation of College Success to Success in Later Life," also "The Relation Between College Success and Certain Later Activities," being two unpublished (May 1931) studies by Drs. G. C. Brandenburg, and H. H. Remmers, of the Department of Educational Society of Purdue University.

CHAPTER VIII

You are wrong if you believe

THAT THERE IS AN UNDERTOW

NEARLY every morning in the newspaper we see that some one has been drowned by the "undertow." Several thousand people are drowned every year in the waters of the United States by the undertow. It is an exceedingly dangerous thing to trifle with and you should keep as far away from it as possible. There is only one difficulty in carrying out this suggestion: there is no such thing as an undertow. Some years ago Dr. William M. Davis, noted Harvard physical geographer made careful experiments to ascertain if there is any such phenomenon and could find no evidence of it.*

Where there is a sharp bend in a swift-moving stream there are likely to be eddies and counter-currents, but that, at any particular point, the water, in some mysterious manner, is sucked underneath the surface in some powerful and deadly undertow, there is no evidence. There is also no evidence that the waves on the seashore form an undertow as they sweep back into the sea. People maintain that when swimmers are out beyond their depths they are often seen to be suddenly sucked under by this mysterious monster. Beyond question the swimmer has either been seized with cramp and his muscles rendered useless, or else he has become frightened or exhausted.

If, Manstreet, you are still fearful that this invisible octopus may grasp you by the feet and suck you under, the only advice I could give would be "Hang your clothes on a hickory limb and don't go near the water."

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* Reported in *Scientific American*, August, 1925. Also Prof. William Henry Pickering, the distinguished astronomer, reported observations tending to show the popular conception of the undertow is a myth. (*Scientific American*, January, 1927.)

CHAPTER IX

You are wrong if you believe

THAT YOU CAN READ HUMAN CHARACTER AT SIGHT IN THE FACE, BODY AND HEAD

OF COURSE, you can read other people's character at sight. It is one of the easiest things in the world to do. Nothing is more exciting! You like it, and they like it. You believe you are reading their character, and they simply eat it up. You believe it because you have no analytical follow-up methods and, therefore, never find out whether you are right or wrong. They swallow it hook, line and sinker because of three fundamental facts of human nature:

First, every human being possesses some degree of *all* human characteristics; every one has some aggressiveness, some will-power, some self-confidence and so on, whether he be tall or short, lean or fat, intelligent or stupid, or have a high or low forehead, straight or crooked nose, "strong" or "weak" chin, or be a giant or a pigmy. Second, everybody is eager to believe that he possesses a great deal of all the good characteristics and very little of the bad ones. Third, nobody knows very much about his own characteristics. Few people can analyze their own personalities without over-estimating or under-estimating their good and bad qualities.

In order, therefore to read other people's character at sight the first thing to do is to memorize forty or fifty words from the dictionary, such as "persistence," "assertiveness," "optimism," "initiative," "frankness," "combativeness" and the like. This is absolutely necessary because very few people can think offhand of more than half a dozen of these good and noble words without practise. Next, you should sit down in front of a person whom you never saw before, and impressively, rapidly and glibly reel these words off. Nine people out of ten will be astonished at how closely you "hit" their real character. Naturally, you hit it because everybody has all these traits. If you see by your subject's expression that you are overdoing it a bit, you can easily hedge by pointing out that of course his "aggressiveness" is offset by his "remarkable capacity to secure cooperation," his lack of self-confidence is offset by his "quick responsiveness to new situations," etc., etc., etc. If you do it skilfully, with a good bass voice and impressive clothes, it is an extremely well-balanced person who will not "fall" for this line of plain out-and-out "bull" and pay with positive joy for the information.

These statements are not imaginary. I have seen people break down and weep at such astonishing revelations of their own unsuspected powers and capacities. They exclaim to themselves, "Here at last is somebody who understands me!" I have seen audiences go wild with cheers and enthusiasm over some lecturer's skilful appeals for them to live up to these hitherto undiscovered abilities. I have known highly respectable women to throw their arms about the lecturer and shower him with kisses for the way he has opened up their wonderful unused possibilities of influence. I have never had this inspiring and touching experience myself, but I have known it to happen to more fortunate (or possibly unfortunate) lecturers. And, as every psychologist who has studied the phenomenon knows, this is the moment when the lecturer signs up the inspired listener for an expensive course of lectures, private lessons and consultations, all of which promise to lead to the choice of just the right vocation, the right lover or wife or husband, and to settle the majority of the troublesome problems of mundane existence.

As evidence, I have several shelves in my workshop filled with volumes and pamphlets, some of them profusely illustrated, dealing with the so-called "Science (God save the word!) of Reading Character at Sight." I have been at a loss how to classify this "literature" (again God save the word!), but after a great deal of thought and mulling over the captions in use by the American Library Association I have finally decided on a very convenient and I think quite descriptive label, namely, "The Literature of Damn Fools." I find it appropriate, even though the introduction to one of these volumes is written by that eminent psychologist and steel manufacturer, Charles M. Schwab. This merely indicates how gleefully business men swallow gold-brick psychology. One can only make a guess, but it seems highly probable that the money expended annually by business men in hiring employees through this magical method and by deluded individuals in having their character "read" by these facial sight readers must run into many millions.

It is impossible to convey the varieties of banality, pseudo science and exhaustive ignorance of scientific psychology exhibited in this mass of flamboyant and contradictory verbosity. It happens that the morning's mail brings me a choice sample of this pompous and capacious nonsense. This particular "psychologist" follows his name with the imposing title of "C.A.V.C." Since I am not familiar with all the heraldic verbal insignia that have been devised by learned bodies to designate various types of scholarly distinction I can only make a guess that this title of C.A.V.C. means "Come Across Very Cheerfully."

At any rate this particular C.A.V.C. offers a "Vocational Guidance Service Based on TEMPERAMENTAL PSYCHOLOGY." Whether this means his temperamental psychology or the other fellow's is not clear. However, it is guaranteed to "reveal we are what we inherit as shown by head, face, hands and body plus our environment, education, experience and opportunities utilized." If we "are what we are" from any other cause than heredity and environment, present-day science has failed to reveal it; consequently temperamental psychology, up to this point is certainly correct. We are further informed that the following lessons are contained in C.A.V.C.'s little book, *Character Read at Sight,* which "should be read by every Student, Teacher, Parent, Employer and Employee." This includes about all except the unemployed and the children. The "lessons" contain the following priceless information:

Lesson No. 1—"The A-B-C of human nature." (This is certainly worth knowing.)

Lesson No. 2—"Profile—showing the convex type or the observing go-getter, the plain type or the neutral, the concave type or the receptive or reflective type."

Lesson No. 3—"Description of the faculties that cause the formation of the top and back head."

Lesson No. 4—"Description of the faculties that form the forehead."

Lesson No. 5—"Character denoted by the eyes." (This lesson reveals how to "make our 8-hour day seem as play." Certainly worth the price.)

Lesson No. 6—"Character denoted by nose, followed by a review of the previous lessons."

Lesson No. 7—"Character denoted by the mouth, including the lesson on magnetic exchange and regeneration." (I fear the finite mind is not quite equal to grasping this.)

Lesson No. 8—"Explanation of the faculties that form the chin and jaw."

Lesson No. 9—"Significance of blond and brunet, including lesson on vibration of the conscious and subconscious mind, heart, lungs, stomach and skin." (To learn how to vibrate the subconscious stomach and skin would seem worth almost any price.)

There are several more "lessons" with a price list attached, all the way from "Educational Guidance," three dollars, up to "Magnetic Exchange Regeneration," which costs ten dollars. Magnetic Exchange Regeneration seems to be the climax of temperamental psychology since it costs the most money.

Now since everybody in these days is reading and talking psychology, and since the average man, as one psychologist has said, "knows how to pronounce psychology but does not know how to spell it" and certainly knows nothing about *scientific* psychology, the question immediately arises: Is there any grain of truth in all this? Just how much of a person's real character can you tell by merely looking at him. Can you or anybody tell by the cut of a man's jib, the size, shape and appearance of his body, face and head what are his actual *permanent* traits of character, or whether he is cut out for a plumber, preacher, executive, artist, baker, butcher or candlestick-maker? Ever since Eve, according to Mark Twain, gave the hippopotamus his name because he "looked like a hippopotamus," and the alligator his name because anybody could see at once he was an alligator and not a reindeer, it has been almost universally believed that both animals and people do, to some extent, look their parts—a crook looks like a crook, a king looks like a king, a pauper like a pauper, a genius like a genius, and a fool like a fool. Even a child at the play or movie can instantly recognize the hero and the villain, the good-natured silly dupe, the scheming dominating landlady, the slick blue-sky salesman, the egotistical blowhard, the generous or stingy father, the son who is going to fall into evil ways but under the influence of the girl make a miraculous come-back,—we can all recognize these characters perfectly the moment they walk on the stage. Can we do it in real life? Everybody thinks he can size up the other fellow at sight with at least some degree of success. The question is: Can he actually do it?

In order to answer this question common sense compels us first to ask another question: Is there any reliable way of getting at a man's true characteristics? Yes, a number of fairly reliable methods have been developed by science in the past thirty years. First, there are highly technical methods of recording a man's past history; second, intelligence and personality tests have now achieved considerable reliability; third, very technical follow-up methods have been devised for testing all other methods, in order to see how they turn out. A fourth method that has proved to be very dependable is that of combining the judgments of a large number of one's friends and associates, known as "pooled judgments."

Let us then put the sight readers of character in competition with a large-scale experiment of reading character by pooled judgments and see which comes off the better. This is surely fair enough. The largest experiment of the pooled judgment type was recently carried out by Prof. Henry Foster Adams of Ann Arbor, a highly qualified psychologist and statistician.

He had eight separate teams of students estimate each other on sixty-three mental and temperamental traits, such as cheerfulness, persistence, etc., and on fifteen physical traits such as height, weight, size of nose, mouth, high and low brow and the like. Without bothering you with technical details this gave a total of over fifty thousand careful judgments, of which five thousand were self-judgments and forty-five thousand were the judgments of each student by his team-mates. The result showed that only eighteen per cent. judged themselves as their friends judged them. Of the remainder, fifty-six per cent. over-estimated and forty-five per cent. under-estimated themselves on all the traits both physical and mental. This alone shows how little people know about themselves and how easy it is to put over on them all sorts of gold-brick psychology.

Perhaps the most astonishing thing that came out of this experiment was that the students were all worse in judging one another's physical traits than the mental traits. That is, they judged their friends' egotism, persistence, timidity, consciencíousness, pride, optimism, etc., more accurately than they judged whether they had high or low foreheads, big or little mouths, Greek or Roman noses, close- or wide-set eyes, or even whether they were above or below average height!

But they were astonishingly correct as to the mental traits. When the list of traits that made up a student's "personality picture" was completed, many other students could easily call him by name—William, Mary, Kathleen, Virginia, Jack, etc.—although the ratings had been confidential and no one knew what ratings had been made by others.

Let us now compare the obvious correctness of these estimates of character with the success achieved by "expert" sight readers. One of the most dramatic of the numerous experiments to test the claims of the sight readers was recently staged at Syracuse University under the direction of Dr. Harry Walker Hepner, Head of the Department of Business Psychology, a practical man as well as a scientist, as he was formerly in charge of personnel work for several large factories and department stores.

In this experiment Doctor Hepner had eighty-eight members of the sales and advertising division of a large Chamber of Commerce, men who considered themselves experts in judging human nature, attempt to analyze at sight from the face and head the mental traits of a group of fourteen college students, some males and some females. The bodies and clothing of the students were covered with students' gowns. This gave the judges an opportunity to study the facial expressions as well as the fineness or coarseness and color of the hair, the color of the eyes, and all the features of the face and head.

The judges were to make the following selections: the student with the most beautiful profile, the student with the best leadership record, the student with the highest intelligence, the two most talkative students, the student who had been the most industrious during the previous four weeks, and the sex of each student. After comparing these estimates with the facts and the pooled ratings of friends, let us see how well these "expert" sight readers succeeded. Quoting Doctor Hepner's own statement:

"The girl who was selected as having the best profile (that is the most beautiful one) was also selected as having the best leadership record, and the highest intelligence, whereas she stood near the bottom of the group in intelligence and leadership. The one chosen as having the lowest intelligence was actually fifth from the top. The two least talkative students were selected as the most talkative. Only three out of the eighty-eight business men judged correctly the sex of all the disguised students. The data indicated that these 'experts' could have done just as well, if they had turned their backs to the person they had analyzed and then written down their rankings in random order."

This one experiment alone throws into the discard a vast quantity of bosh that has been believed for untold ages about our ability to judge people's real character by the features of the face and head. Another extensive experiment that pretty well puts this popular notion out of the running was one that was carried out by Dr. Glen U. Cleeton of the Carnegie Institute of Technology, and Dr. B. F. Knight of the University of Iowa. In this study Doctors Cleeton and Knight had a number of people rate some thirty college students with whom they were well acquainted on the following traits of character: sound judgment, intellectual capacity, frankness, will power, ability to make friends, leadership, originality, impulsiveness.

The ratings of these friends when pooled had a high degree of agreement. We can, therefore, accept them as being substantially correct.

The next step was to place the thirty students on a stage in groups of ten each in the presence of seventy judges who were to rate them on these eight traits of character, with only their heads, faces—and *expressions*—visible. The judges were allowed all the time they desired to study each face. They were business men, school superintendents and students of personnel management—persons who considered themselves experts in judging people.

After this was completed Doctors Cleeton and Knight calculated how closely each trait was associated with the physical measurements of the head and face.

They had already made a large number of very careful head and face measurements of each of the thirty people, high brows, low brows, big noses, little noses, pug noses, small eyes, large eyes, wide-set eyes, close-set eyes, and equally accurate measurements of mouths and chins, etc. The conclusions of the whole investigation were absolutely devastating to all claims of people who think they can read character at sight, at least by looking at a person's face and head.

In the first place, there was no agreement of importance between the rating of the judges, and the previous ratings made by close associates from real life. The "experts" would have done just as well with their backs turned. In the second place, *no two judges agreed on what any feature of the head or face indicated.* The students with high foreheads were rated by some one way and by others another. On the whole, the high foreheads were judged to have no more intelligence, will power, leadership, ability to make friends, etc., than the low brows. Big mouths, little mouths, straight noses and crooked noses, and all other features showed the same confusion. In the technical language of the investigators a few words sum up the whole matter: "The physical factors purporting to indicate the same trait of character do not present even a suspicion of agreement. . . . The following conclusion received clear support: Physical measurements which underlie character analysis agree neither with themselves nor with other measures of character."

We could pile up scores of other investigations just as smashing in their refutation of our ability to read character at sight in the face and head. Back in 1905, Prof. Karl Pearson, of the Galton Eugenics Laboratory of the University of London, measured the heads of eleven hundred Cambridge graduates and five thousand school children and showed that these head measurements bore no constant relationship to such physical and mental characters as temper, popularity, self-consciousness, shyness, conscientiousness, hair-color, eye-color, curliness of hair, and general intelligence. In 1913, Sir Charles Goring of the same laboratory published a monumental study of the head and body measurements of fifteen hundred English convicts. It completely routed Lombroso's famous theory that criminals differ in bodily and facial make-up from honest people; and Goring found the imbeciles and weak minded criminals to have higher and "nobler" brows than the intelligent convicts. His study indicates how utterly unreliable are the vague emotionalized guesses of policemen, lawyers, courts and juries in picking out the "low-browed" or "narrow-eyed" crook, when thousands of actual measurements can discover no significant differences between the head measurements of criminals and the head measurements of administrators of the law!

More recently, Dr. Clark L. Hull, formerly of the University of Wisconsin and now of Yale, with one of his students, Miss Elsie B. Sherman, has devised an elaborate instrument, called a radiometer, by which nineteen different head measurements of great accuracy can be made at once and combined in one index. With this instrument they "radiographed" the heads of a group of seventy-eight entering freshmen to see if they could predict their success in such studies as chemistry, English, mathematics, mechanical drawing, forge-shop work and machine-shop work. They believe they have attained about as good results as are obtained from intelligence tests, which means only a moderate success, but are careful to point out criticisms of their own work. However, the very fact that it requires this micrometric instrument to achieve such moderate and doubtful results, is a powerful refutation of reading character at sight, since no human being could possibly measure anybody's head in nineteen different dimensions to the one hundredth of an inch by rough visual observation. You might as well try to measure with your eyes the distance to the moon!

The plain fact is that all character reading by looking at the face and head, whether by professionals or amateurs, assumes the old doctrine that each one of our mental "faculties" is located in some particular spot in the head and causes a bump or depression at that point owing to its strength or weakness. This doctrine has been ninety per cent. exploded by modern anatomy and psychology. In a masterly review of the whole field, entitled *Physique and Intellect,* Dr. Donald G. Paterson, psychologist of the University of Minnesota, points out that the standard character-reading charts, published to-day in scores of volumes that have enormous circulation and are relied upon by many business men in hiring employees, still locate the "sense of color" just behind the eyes, whereas it is really located at the back and base of the brain. As far wrong in their geography as they could possibly be! They locate "worship" at the center of the top of the head, whereas this is really the area that controls chiefly such unspiritual activities as wiggling the toes. Other "faculties" are just as absurdly misplaced.

There is another practically universal belief, namely, that blonds differ markedly from brunettes, some gentlemen preferring one type and some another. The high priestess of this cult is Dr. Katherine M. Blackford, whose volumes on character reading are relied on by thousands of business men. She sums up her "studies" of blonds and brunettes as follows:

> "Always and everywhere the normal blond has positive, dynamic, driving, aggressive, domineer-

> ing, impatient, active, quick, hopeful, speculative, changeable, and variety-loving characteristics; while the normal brunette has negative, static, conservative, imitative, submissive, cautious, painstaking, plodding, slow, deliberate, serious, thoughtful, specializing characteristics."

In order to test these theories Doctors Paterson and Katharine Ludgate of the University of Minnesota had each of ninety-four educated men and women select two pronounced blonds and two pronounced brunettes of his acquaintance. He was then to indicate which of the special blond and which of the special brunette traits enumerated above by Doctor Blackford were possessed by the subjects.

The astonishing result was that almost exactly as many brunettes as blonds were judged to have the blond traits; and vice versa. Only sixty-three per cent. of the blonds showed what Doctor Blackford claims blonds ought "everywhere and always" to show, while sixty-one per cent. of the brunettes showed what brunettes are supposed never and nowhere to show. Both types in fact ran ludicrously untrue to form.

Another experiment to test these claims about blond and brunette traits was made by Dr. H. G. Kenagy of the Carnegie Institute of Technology, Pittsburgh. Doctor Kenagy had forty sales-managers in thirty-eight business organizations rate their very best-producing salesmen on Doctor Blackford's twelve blond traits and fourteen brunette traits. It turned out that out of the one hundred and fifty-two high-production salesmen, eighty-two were brunettes while only seventy were blonds. Either this is a smashing disproof of Doctor Blackford's claims, or else it means that the "positive," "dynamic," "driving," "aggressive," "active," "hopeful" man of Doctor Blackford's blond traits makes a poor salesman, while the "negative," "static," "imitative," "submissive," "slow" man of the so-called brunette traits is the man you want to employ as the go-getter in producing business. I leave business men to judge from their own experience which horn of the dilemma to choose.

Again we all still cling to the belief that fat people differ in character from lean people, and tall people from short people. A German psychiatrist, Doctor Kretschmer, has stirred up a great deal of interest by a ponderous volume which makes extensive claims to being able to diagnose various types of abnormal personalities and insane persons by body, shape and size. He outlines four types of body, each one of which indicates (to him) a corresponding type of insanity or abnormal behavior: First, the "Pyknic" type,—the typical short fat person; second, the "Athletic" type—the person of symmetrical build; third, the "Asthenic" type—long and slender; and fourth, the "Dysplastic" type—those not fitting into any of the other three classes. It seems a wise precaution to have this last type which perhaps had better have been named the "elastic" type, so as to have an extra model at hand that partakes of all the types whenever your theories do not happen to fit one of the other standard models! Practically all professional character readers use these first three types and keep the extra "Dysplastic" type on hand for emergencies! Doctor Kretschmer goes further and, with quite romantic rhetoric, finds numerous normal traits to be indicated by these bodily types. All attempts, however, by American students to fit normal people in with these types of body, and the general mental traits supposed to go with them, have been utter failures when applied to individual cases.

One investigator, the late Dr. S. Naccarati of Columbia University, combined a number of bodily measurements into a single body index figure, and thought he could predict intelligence with some success by getting a person's body index. However, Dr. William H. Sheldon duplicated Doctor Naccarati's work by a study of four hundred and fifty students in Chicago University and concluded that you could size up a person's mental caliber far better in a ten-minute talk than by measuring the length or size of his legs or arms, or the length of his belt, or putting him on the weighing scales.

Doctor Sheldon also made a large research on the tall, short, fat, thin, flabby, athletic and other types of body to see if they indicated any of the following traits of character: sociability, perseverance, leadership, aggressiveness and emotional excitability. He found a slight indication, although *very* slight. Fat men were slightly more sociable than thin men *as a group.* Big tall men with large frames were slightly more aggressive. The big-bodied fellows, whether tall or short, were somewhat higher in both sociability and leadership than the opposite types. Incidentally they were also a little more stable and less excitable; they were also slightly lower in perseverance, although the persevering fellows, whether big or little, tended to get higher grades for scholarship.

So there you are—*nothing but slight tendencies when applied to large groups.* This merely means that among one thousand fat men or women you would likely find a few more persons who were "jolly" and "cheerful" or "aggressive" or "timid" than you would find among a thousand slender, skinny people. However, the particular fat man you picked out as "jolly" and "cheerful" might easily prove to be the leader of the "Lugubrious Glooms" while the thin man might be president of the Optimists Club. Chester Conklin, Fanny Brice, Charlie Chaplin, Charlotte Greenwood, Elsie Janis, Marie Dressler, Sophie Tucker, Harold Lloyd, Grant Mitchell, the late Raymond Hitchcock and the great John Bunny are all recognized as clever comedians and fun-makers, but they represent utterly different types of bodies, faces and heads.

The fact is that, if anybody could read character at sight with any certainty, every college and university would pay such an "expert" twenty times the salary of the highest paid professor and have him meet the incoming trains during the opening week and send home the young men and women who lacked the intelligence and personality traits to succeed. One famous character-reading expert told me recently that he had "not made a single mistake in reading a single human being in the past forty years." He has made only a moderate fortune, but if he can prove his statement, I will guarantee to land him a salary of a million a year within a week! It is true that we hear a great deal nowadays about "glandular types," "glands of destiny," "glands of personality," etc. The glands do to some extent influence personality and also influence body, shape and size. But I have talked with many of the conservative leaders in this field of research and they all scout the idea of reading an individual's character with any certainty by this method. Dr. Charles Stockhard of Cornell University has recently done important work on the influence of the glands in producing the different types of dogs with their various mental traits. He too thinks tall slender people differ somewhat in personality from short fat people. They probably do if you take them by the hundreds or thousands. But again you are dealing with large groups. When you go to picking out the individual by rough visual observation you butt your head against a stone wall.

Of course, no student of this important problem is so unscientific as to claim remotely that there is *no* relationship between a man's appearance and his traits of mind and personality, but these relationships are so varied, so delicate, so elusive that all attempts to measure them in single individuals with the finest instruments have been little short of flat failure; and every practical test of judging them by the unaided vision has been a ludicrous failure. Somebody may some day discover the magic secret, but so far nobody has done it.

The sum and substance seems to be that a man's mental, temperamental and "spiritual" traits are chiefly the product of his central nervous system: that is, his brain and spinal cord. And this seems to have little relationship with the size or shape of his body or head. Doctor Paterson here makes an apt illustration: When you see an automobile of a certain size, with certain stream-line effects, upholstery and accessories, you expect to find a certain type and capacity of engine. But nobody is fool enough to suppose that the artistic lines and size of the body are the *cause* of the horsepower capacity of the engine, or that the engine causes a certain type of automobile body or accessories. So, with reference to the human body and mind. There seems to be little relationship between a man or a woman's stream-line effects in face or body, or upholstery, either natural or artificial, or the accessories, such as shape and size of nose, mouth, ears, chin, hands or feet and the mental dynamo within; and it is the mental dynamo that determines behavior and character. Girth control and mental control seem to be in the main two different types of natural phenomena.

I appeal, finally, Manstreet, to your common horse sense. Neither you nor any one else can find any evidence that red hair indicates a fiery temper, or that coarse hair or coarse features indicate a coarse nature or that large passionate eyes indicate a passionate nature. The sweetest woman I ever knew looked like a hippopotamus, and reared eleven sons, six of whom became eminent preachers, and five became successful business men; and the meanest man I ever knew looked like Angelo's statue of Moses. I know a kind-hearted, sweet-tempered millionaire who, without the slightest make-up, could walk on the screen and pose as the movie villain, and a restaurant waiter who looks like a Roman senator. Deep corrugated wrinkles between the eyes in one man may indicate great power of concentrated thought and in another man, or even *in the same man at another time,* may indicate stomach-ache. Close-set determined lips may indicate executive capacity or kidney trouble. A big powerful chin may be a "fighting chin"; it might also indicate to a biologist that a big strong-boned man, had married a tiny small-boned woman, and that the child had inherited his jaw-bones from his father, and his skull from his mother. He might thus have the jaw-bone of an ass, and the skull of a genius; or, we regret to say,—with apologies to the ladies,—he might have the skull of an ass and the jaw-bone of a genius. At least this would be as good a guess as any character analyzer on earth could make by using even his marvelous powers of observation.

Of course, people dress differently in different occupations. Horse traders do not dress like college presidents. But put men in the same kind of clothes, give them the same amount of soot, grease and sunburn on their hands and faces, and experiments show you can not tell the engine-wiper from the railroad president. The upshot of it all is that if you wish to choose your vocation, pick out a crook, select a husband or wife, or hire an employee, you had better consult scientific psychologists and conservative students of personnel and experienced vocational counselors. They are far from infallible and will urge you to take their findings only as a first approximation and to follow up their counsel with further observation. But instead of paying *any sort of "expert"* to do it for you by reading character at sight from the body, face or head, there will be two distinct advantages gained if you merely toss a coin: first, you will stand just as good a chance of being right; and, second, you will still have the coin.

Ninety-nine people out of every hundred with whom I have ever discussed the subject of judging people's character at sight and who have not studied the matter by critical objective methods disagree with the conclusions set forth here, often very vehemently. This is strong additional evidence that the conclusions brought out in the foregoing pages are true.

CHAPTER X

You are wrong if you believe

THAT CHILD PRODIGIES PETER OUT

I AM often asked why it is that all these child geniuses, who create such a stir in the newspapers, soon peter out and become nervous and mental wrecks. I always reply that they do not. Two or three rather famous child prodigies are said to have broken down physically, but these cases have been unduly exaggerated. In fact, they have been so foolishly exaggerated that many parents of brilliant children have told me they have done all they could to discourage their bright children from progressing too fast mentally for fear they might become prodigies and go to pieces.

I never could see why if a child of eight could without effort think as well as a child of sixteen it would be likely to burst a blood vessel or injure its brain or digestion. Thinking never hurt anybody. In fact, as Emerson asserted, it is probably easier for great men to do great things than for little men to do little things.

In order, however, to furnish objective evidence on this point Prof. Lewis M. Terman of Stanford has now followed the one thousand brilliant children—many of them true child prodigies—that he and his colleagues have discovered and studied, through ten years of their growth and schooling. They were not only somewhat healthier and stronger than average children to begin with but have remained so. Not a single one has shown any tendency to peter out or become a physical wreck.

What better evidence do you desire? You need not be afraid, Manstreet, that your child will be a nervous wreck or die young just because it has brains.

CHAPTER XI

You are wrong if you believe

THAT YOU CAN READ YOUR CHARACTER AND DESTINY IN THE STARS

OF ALL the false and foolish flapdoodle that has ever befuddled the faculties of this funny human family, the notion that the stars govern your character and destiny has always seemed to me to be the prize sample. It belongs of course to that vast coterie of mystical beliefs and hopes that by some sort of short-cut, such as watching the flights of birds, studying the entrails of freshly killed animals and listening to the croakings of frogs or the ambiguous chatterings of loquacious oracles, men could foretell coming events and read the character and intentions of their fellow men.

Science has laid all these notions in the vast graveyard of bygone superstitions so long ago that scientific men have forgotten their existence. They seem indeed to be unaware of the fact, or at least disregardful of it, that such notions still govern the lives of literally millions of people, many of them highly intelligent, but all of them poorly educated in science, even though they dwell in the midst of scientific discoveries and inventions that make it impossible for such beliefs about life and the universe to be true.

But to come squarely to the issue, my dear Manstreet, if the claims of the astrologers and all the numerous dealers in hokum, such as palmists, theosophists and character readers, all of whom think about natural processes by precisely the same type of mental processes, are true, then all we can say is that *the science of the past three hundred years is utterly un-*

true. This is something to which I believe every qualified scientist in the world to-day would agree. While the astrologers, like all the allied tribes of dealers in hokum, both plain and fancy, claim to use scientific methods and while they talk about the "science" (!) of astrology and make the absurd claims that they base their sciences upon the infallible grounds of mathematics, again all I can say, after thirty years devoted to an intensive study of the biological sciences, which involve of necessity considerable knowledge of the higher mathematics, is that, if they are correct, I have totally failed to grasp what science is, or what mathematical functions and relationships are; indeed, I have failed totally to understand what sort of a universe it is we live in and what its natural processes are in so far as science has revealed them, based as science is upon the central concept of quantitative measurement.

Science, Manstreet, is measurement; it is a description of the universe and its operations in terms of quantity and number. And in my own humble but earnest efforts to comprehend those numbers and measurements which constitute science and which give us knowledge of our world, I have for many years drawn profound inspiration from some statements as to the nature of science made by three of the very great scientific minds of the latter half of the nineteenth century and the early years of the twentieth. One of these great minds and spirits is, thank heaven, still living and working among us and is daily adding to the sum of truth, to which astrology, as such, has never added a single grain in all the centuries and never will.

The first statement is the following from Lord Kelvin, quoted by another great scientist, Karl Pearson, in his monograph, *Nature and Nurture, The Problem of the Future.*

> "Accurate and minute measurement seems to the non-scientific imagination a less lofty and dignified work than looking for something new. But nearly all the grandest discoveries of science have been but the rewards of accurate measurement and patient, long-continued labour in the minute sifting of numerical results."

The second is from Sir Francis Galton. It is one of the mottoes of the Galton Laboratory for National Eugenics and the promotion of the Science of Biometry, which is the measurement of all the processes of life, both social and organic, and of which Galton was one of the chief founders. This motto was one of the guiding principles of that great and fruitful mind and runs as follows:

> "Until the phenomena of any branch of knowledge have been subjected to measurement and number, it cannot assume the status and dignity of a science."

The third dictum is that of Prof. Edward L. Thorndike of Columbia, and is one of the most widely quoted statements of scientific principle, method and ideal in modern scientific literature. Professor Thorndike says:

> "Our ideals may be as lofty and subtle as you please, but if they are real ideals, they are ideals for achieving something; and if anything real is ever achieved it can be measured. Not perhaps now, and not perhaps in fifty years from now; but if a thing exists, it exists in some amount; and if it exists in some amount, it can be measured."

Now, I challenge herewith all the astrologers both living and dead to furnish any evidence that they have ever subjected their so-called science to the rigid, prolonged, patient, unbiased, unemotional, painstaking, statistical and experimental methodology to which these great utterances by great scientific men unequivocally demand it must be submitted. Only by such testing can any body of facts by any stretch of the intellect or imagination be called science. And if it is not science and has not been reduced to measurement and number, and is yet something that purports to explain any phase of the operations of nature, then it has not and, so far, can not present the evidence that is absolutely essential to proving that it is true.

Please recall here, as I have frequently urged, Manstreet, that science is not all of truth. It is only one form of truth and, therefore, constitutes only a small portion of the truth of life. But science does constitute practically all the truth we know about the processes of nature. And since astrology assumes to deal with a large body of natural phenomena, since it claims to explain them, to classify and evaluate them, to make definite statements about amounts of existence and the relationships of these amounts of existence to other amounts of existence, then the astrologers can not hide behind any poetical or mystical or evasive assumption that astrology is an art and attempts only to give us artistic truth. *They must undergo the rigid requirements of scientific truth.* And that is a wholly different matter. And this they have never done. Indeed, if the astrologers have ever published a single page of statistical, analytical or experimental data that has been subjected to the standard treatments demanded by scientific methodology, then I can only say that a search of the libraries of Columbia University, of the New York City Public Library. the

Congressional Library at Washington and other libraries, and through large quantities of technical journals, has failed to reveal it.

Until astrologers take the trouble to do this and take the trouble to learn scientific methods sufficiently well to know how to do it, then their claims to truth-telling in the analysis of human character are wholly unworthy of credence. It is *not even worthy of scientific investigation,* unless one wishes to take it up as a study in genetic or abnormal psychology. That is perhaps why scientific men have taken so little trouble to refute the astounding claims to scientific standing it makes for its jumble of chaotic jargon.

I care little about astrology, in so far as grown people may wish to believe in it. If they wish to befool and befuddle their lives in an age of science with this sort of unsophisticated, emotionalized and multitudinous loquacity, they are welcome. If they wish to buy stocks in the market on the basis of the position of Leo or Sagittarius or Scorpio instead of on the basis of earnings, sound management, scientific personnel, properly trained salesmen, prospective markets, supplies of raw materials, general price trends and the like, they are as welcome to do that, so far as I am concerned, as they are to play roulette or stud poker or put their money on slow horses or fast women. All of these are pleasing human diversions to a great many people; and I have never felt inclined to interfere, by anything more than moral suasion and personal example, with my fellow man's going to heaven or hell by the route that may give him what Herbert Spencer termed the greatest "surplus of agreeable feeling."

But I do feel profoundly concerned with the minds and morals, the outlook on life and the universe, of our young people. I do feel that the world is in a very critical intellectual and moral situation particularly with reference to the social and ethical philosophy of youth. I have in other chapters tried to outline to you, Manstreet, something of what I feel that situation is. But may I repeat here that we are living in an age that is almost wholly the product of that new spiritual attitude and that new intellectual method called science? And the mere handling of scientific instruments, scientific products and discoveries, whether they be scientific razor-blades or scientific airplanes, does not civilize the people who handle them. I have, for example, gone into great printing and binding plants where men were manufacturing books and journals of scientific technology; yet I have found even this exposure to science does not make scientists out of the workmen or give them the scientific spirit. They are just as likely to go from their work to a spiritualistic séance, or to an astrologer to have their horoscopes read, or to a palmist or crystal-gazer to have their character analyzed and their fortunes told, as are the men who work in factories for the production of chewing-gum or steel bars or lard.

These facts have profound educational, ethical and social significance. They show that the use of scientific products does not make people any better or wiser than the use of the primitive flint, or the stone hatchet for killing their enemies, or the flail for threshing out wild grain for food. An electrical cooking range gives a woman leisure, but it does not teach her how to use that leisure to any better social or ethical ends than the old-fashioned crane, kettle and tongs. We could multiply instances endlessly. When people make their money out of science, and build their homes out of its products, and conduct almost their whole lives by the use of its discoveries and creations, and yet do not appreciate or understand the mental processes that brought about these creations, they are really no wiser than they were without these products of scientific genius; indeed, such half-educated people are vastly more dangerous and in greater danger of blowing the social order to pieces by unscientific social theories than when they were more limited in power.

This bears on the problem of the enormous ethical significance of such a thing as astrology. When, for example, you see great national magazines and some of our leading newspapers publishing articles advocating astrology as a guide to life and character, as a guide to the selection of husbands and wives and their management, and, indirectly, as a guide to the education and moral development of children, it is high time that educated people should make a protest. I say educated people because I have never yet known an educated person who believed in astrology. I do not believe there ever was one who was educated in the modern sense, that is, thoroughly trained not merely in scientific knowledge but in the methods by which that knowledge is discovered.

It may be objected that my definition of education is arbitrary and merely my own personal notion. But it so happens that the high schools, colleges and universities throughout the whole Western World, the National and State Education Associations, the National Departments of Education of every civilized country on the globe, and the whole sweep of modern educational theory and practise have precisely the same definition of education. That is, they include as an absolute requisite of education the understanding of science. Before any of these agencies give any boy or girl, man or woman, a certificate as an educated person, they at least make the endeavor to have this person understand the fundamental methods of scientific thinking. They can not, of course, completely achieve this educational ideal; but it *is* the ideal of every educational institution throughout Western civilization; and it is achieved sufficiently well so that we are justified in saying that any person who does not understand science and scientific methods belongs to the vast, multitudinous company of the uneducated or half-educated.

And it is not the ignorant but the half-educated who constitute the most dangerous group of persons in the modern world. This is because many of them are persons of high abilities, persons who have often the highest types of literary and artistic culture, persons who achieve great wealth, power and influence; many of them are great and influential writers, public speakers, artists or musicians. They form cults and societies and guilds and issue journals and propaganda and secure a vast amount of time on the radio. Yet all of this does not in the least save them from being very clearly defined as half-educated people, provided we use the word educated in the sense in which it is used here and used, I am sure, in every University Department of Education in the world.

These half-educated persons are dangerous just because of two things: first, they achieve power, wealth and influence by using the instruments and discoveries of science; and, second, owing to their lack of an understanding of science, they do not hesitate to use this vast influence in such a way that it reacts both directly and indirectly against the utilization of science for the upbuilding of sound, clear-headed, straight thinking about life and its problems, especially among our youth. And any influence is bound to be intellectually disintegrating and morally degrading if it works directly or indirectly against teaching our youth how to utilize science in the conduct of life, in the construction of ethical ideals, and in methods of cooperation toward the highest ends of the social process. And that, in my judgment, is precisely what astrology and all its kindred beliefs are doing to the minds and character of our young people whenever they are exposed to its baneful intellectual and spiritual influence.

Articles in our magazines and newspapers, pleading with our young people to conduct their lives, develop their moral outlook, manage their business, their homes, their love-affairs by the absurdities of astrology are, in my judgment, bound to be just that—intellectually disintegrating and morally degrading. All astrology is of this character. It presents a view of life and the universe directly opposed to the intellectual integrity, ethical nobility and spiritual grandeur which science has brought to mankind since it was created by the Ionian thinkers as an intellectual discipline six hundred years before Christ.

For, Manstreet, if science has given men nothing but machines and chemicals, means of preserving schoolgirl complexions or preventing coughs by the carload or even healing our bodily ills, then the game is hardly worth the candle. It has given us a thrilling joy-ride, but it has landed us in the same old mud and mire of ethical, intellectual and spiritual superstition. We are no better morally nor have we developed greater and better social processes. In short, we have learned nothing.

Now, of course, Manstreet, a great many men have learned a great deal; but those who, in a world of science, still pursue the superstitions of astrology as guides to ethical and social living have learned nothing from science. Science can teach them nothing except how to make money and take a physical joy-ride.

It is a matter of deep regret that scientists have not thought it worth-while to make a few critical investigations by which the practical claims of the astrologers could be easily and completely exploded. The reason no doubt why they have not taken that trouble is, as I have already intimated, simply because if our lives and character, fortunes and misfortunes, successes and failures are to any degree under the influence of the planets or the stars, then all we know of physics, chemistry, psychology and biology is so much nonsense. But all that any scientist would need to do to ascertain the truth or untruth of the contentions of the astrologers would be to take two or three hundred persons born at the same hour, and analyze their temperaments, mental abilities, character traits and practical fortunes. It would be an easy matter to subject all of these persons to two or three hundred tests, which when completed would give us a fairly accurate picture of their intellectual capacities and personality traits, their inner interests and passions. Then all that would be necessary would be to take the data from these measurements, plot them out on a cross-ruled sheet of paper in what is commonly called a "scattergram," draw a curve round them, and see if it was not bell-shaped, or what is termed a curve of normal frequency; in other words, it would reveal whether or not people with the same horoscope exhibit normal variations.

If the frequency distribution of these traits, when plotted for each individual of the entire group, or combined into one, turned out to be comprehended within a normal Gaussian or bell-shaped curve, then there would *never be any need for further examination of the subject of astrology.* It would die a violent though probably painful death on the spot. As I so often point out in this book, Manstreet, just one little experiment, properly conducted, may easily demolish the most elaborate beliefs, although they be hoary with the gray of ages or enshrined in the loftiest and most majestic temples where only the holy of holies is supposed to be preserved.

So far as I am aware, this precise experiment has not been performed; but if the astrologers themselves were scientists, as they claim to be, or had the noble passion for truth, the insatiable curiosity and the endless patience that characterize the scientist, in short, if they possessed common scientific honesty and understood scientific method, they would have performed thousands of these experiments themselves. I am of course not speaking of personal honesty or personal nobility of character; because I know many astrologers who, personally, are noble and lovable people. I am here speaking of scientific nobility and honesty. The astrologers, for example, proclaim loudly that the test of the truth of astrology is that it "works." Of course, it works. Telling fortunes by tea leaves or by the foam on your coffee-cup works provided people want it to work. We are all superstitious by nature and remain so unless science knocks it out of our heads.

I have just returned from luncheon across the street. As I came out of the restaurant I took occasion to drop a penny in the slot and weigh myself, and I was naturally pleased to have this machine analyze my character favorably. It not only gave me my weight at one hundred and sixty-five pounds but also shot out a card, which had the following exciting information: "You have the ability, found in very few people, of being able to see things from another's view-point." I haven't a bit of doubt of it, but I was delighted to have it so intelligently and authoritatively recognized. And all for only a penny's expense! When you go to an astrologer or palmist or other necromancer you also get a lot of these charming sentiments about your character and usually vague hints about your probable fortunes, but the cost is many times greater.

And people are charmed. I have seen the most highly intelligent people exclaim that they did not see how it could be done. The astrologer may be perfectly sincere. I rarely have any doubt of the utter sincerity of all sorts of necromancers and charlatans. They have a positively holy zeal for their work. Many of them believe they are the crusaders of a new life. Indeed, it is this very passionate zeal that often prevents them from subjecting their doings—I scarcely know what else to call them—to statistical and experimental analysis. But they perform no experiments under controlled conditions; they collect no statistical data; and if they did they would not know what to do with them or how to analyze them. They could not construct a curve of frequency if their lives depended on it. Yet there is absolutely no other way by which analysis of character can be properly carried out or evaluated. I have talked with numerous astrologers but never knew one who would recognize a sigma or a standard deviation or a probable error or a regression equation or a curvilinear correlation, or any of the standard devices of statistical procedure, if they saw them coming down the street. Without these, I challenge them to prove their case in the icy cold but perfectly clear and utterly just and fair court of science.

Chapter XII

You are wrong if you believe

THAT YOU CAN READ YOUR CHARACTER AND DESTINY IN THE STARS—*Concluded*

The astrologers maintain that the reason the scientists do not recognize astrology as a "science" is because the scientist and astrologer live on two different "planes." I must confess that when people start talking about "higher and lower planes" of existence, I always reach for my hat and escape as unobstrusively as possible. A scientist simply can not argue with these higher- and lower-plane people. Nor can a scientist argue with people who talk about "spiritual evolution," or "evolving into a higher life." This is because there is *no common ground upon which you can make even a beginning.* For this reason I never argue with a cultist of any type or description. The scientist has been educated to believe solely in measurement and number, in quantity and amount and degree and relationships among these, while the higher and lower-plane persons and the cultists of all sorts have not the slightest conception of what these things mean. They even read books about science, such as those of Sir James Jeans, Sir Arthur Eddington and Havelock Ellis, and think that they understand science. But they never go into any of the original data and documents of science and work anything out for themselves. They even twist the statements of these great men to suit their own mystical or pseudoscientific interpretations.

All such books are enormously helpful, if properly read and reflected on with that common sense which, after all, when coupled with artistic imagination, is the basis of science. But many persons imagine, as Huxley pointed out a half-century ago, that scientists learn science chiefly out of books. Not so! The books of their colleagues may aid them, but they learn science by the study of nature, and they learn it in no other way. And when people talk about higher and lower planes of life, they should recall that eloquent and beautiful passage by William James wherein he points out that any one who has ever looked on the face of a dead child, and has reflected that even for a moment common clay could have embodied and expressed so much beauty, and have held thoughts and emotions larger than the universe itself, will never again speak of higher or lower orders or planes in nature. Nature is all "higher," especially when we look at it through the clear penetrating eyes of science—the only eyes that can ever look upon nature with the utter appreciation that comes from profound knowledge of its operations and complete trust in its logical integrity.

The astrologers and the pseudoscientists have never known this view of nature and, until they study nature herself—its grandeur, its nobility, its beauty, its call to utter truthfulness—they never will.

If they have any of the scientist's passion for nature's own integrity, if they have any of its call to rigid logic, if they have, indeed, any of the scientist's curiosity to find out whether he is right or wrong, then let them take their data to the laboratories of the universities; let them submit their claims to students trained in the highest refinements of experimental method and statistical procedure—students who care nothing about the outcome, who have no ax to grind, who wish neither to fool nature nor to let nature fool them. Then see what happens! I challenge them one and all to show this much simple and common honesty—honesty with nature, honesty with their fellow men.

Astrologers assure us that, by having the hour of your birth, they can by mathematical methods (!) make out a chart of your traits of character, and even diagnose and offer remedies for your bodily ills. Some of them go further and undertake to predict the future events of your life.

Very well. Let us consider that if you were born under Capricorn or Libra or Taurus or any other sign of the Zodiac, the light that fell upon you at that hour started toward you from these distant stars and constellations in most cases several million years ago. Just where those stars are now, it is literally true heaven only knows. Certainly it taxes human credulity to believe that the "influence" of these stars and their various combinations with the planets travels any faster than light.* It would seem that was fast enough for all practical purposes. Yet if the influence does not travel faster than light, it again taxes human credulity to believe that rays of light or energy, which started from some ball of fire or bag of gas millions of years ago, are going to determine your character and destiny to a greater extent than the chemical packages in the germ-cell from which you were born, combined with the environmental and educational influences that pour in every moment on your bodily and mental structures as you grow up. I judge from talking with astrologers that they believe this "influence" from your Zodiacal Sign is a definite physical thing because they are always talking about "vibrations." But the utmost analysis that science can give of the rays of vibration from out the universe reveals nothing of a *qualitative* nature about them. They are rays of light—which the physicists now assure us are made up of definite quantities or particles, or they are rays of energy, which they again assure us are quantitative, much like infinitely fine drops of rain or bullets.

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* Some "schools" of astrologers speak with scorn of the influence of the stars; they claim it is the influence of the *planets*. Perhaps the finite mind had better cease its efforts to comprehend this delicate esoteric distinction.

Now unless we can conceive that there is a profound difference in these vibrations or radiant bullets or particles of light as they strike different children, it is hard to see how else they would cause one to be conservative and another radical, or one to have a passion for success and another to be lazy and slothful, one to be generous and another stingy, and so on.

In a recent article, Miss Evangeline Adams informs us that most women born between September twenty-fourth, and October twenty-third have sex as a big factor in their lives and "rightly so." Women born between July twenty-fourth and August twenty-third are generally "magnetic" and feel that they "should rule by divine right." And so on through the twelve signs of the Zodiac, she delineates twelve different types of wives and seems to imply that there are also twelve different types of husbands.

Now, you will recall that modern psychological science has been able to discover only *one type of human being in the world, namely, mediocrity.** It is a great sport for people who know nothing about psychology to set people off into types; but the psychologist whose business it is to study human nature by exact methods has not been able to do this. These types exist, in so far as is now known, only in the imagination of psychological romancers and romantic psychiatrists; and heaven knows there are plenty of these two "types."

There is another question that puzzles me, but I suppose the astrologers can answer it. Beside the fact that the rays or vibrations, which make up the planetary and starry influences determining your character at the hour of birth, must have started on their journey millions of years before you were born, it is difficult to see why it is that twins who are born within a few minutes or a few hours of each other always have almost identical characters and personalities *if they are born from a single germ-cell,* but usually have radically dissimilar characters and personalities if *they are born from separate germ-cells.* To me this is a poser, but no doubt it is a simple twist of the wrist to the astrologer to explain it.

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* See page 29.

If all twins were identical twins, the astrologer could maintain that the planets and the starry universe generally had not shifted round enough between their birth hours or birth minutes to make any radical differences in their personalities. Or if, on the other hand, they were all born dissimilar or what is known as "fraternal" twins, they could maintain that the universe had made some radical shifts in between their births and brought about these radical differences, even to the extent of making one a boy and one a girl, or making one brilliant and the other dull, as is often the case with fraternal twins but never the case with identical twins. How they can solve this dilemma baffles the finite mind. From the dogmatic wisdom exhibited in the *ex cathedra* psychological and biological utterances of some of the leading astrologers, we are, perhaps, showing disrespect in classing their minds as finite.

There is another difficulty that might trouble a finite psychologist but which, so far as I can find, has never entered the head of an astrologer. I touched on this problem in the chapter on reading character at sight. What are we going to call a personality trait? This problem is so extremely involved that I shall make no attempt to elucidate it, except to say that to the leading psychologists in the field, such as Dr. Mark May, Dr. Hugh Hartshorne and Dr. Floyd Allport, it involves psychological problems of the highest intricacy and the greatest profundity. I do not believe any astrologer has sufficient education in psychology even to comprehend what these problems are, let alone how to study them intelligently. At most psychologists have achieved only a partial answer. I challenge astrologers to do better with their own familiar stock in trade.

Lastly, Manstreet, there is in science a concept known as the "parsimony of nature." Speaking a bit loosely, it means that nature does everything in the most economical way possible. She always takes, so to speak, the shortest distance between two points. She does not make detours if she can avoid them. This "law" means, therefore, that if you have been able to measure or number or weigh a sufficient number or degree of causative factors in any phenomenon to account adequately, or well-nigh adequately, for its effect, then it is not only a waste of time, but illogical, because of nature's way of doing things, to look for more causes. Now, while of course we do not pretend to know all the causative factors in human behavior, I believe psychologists and biologists do feel they know enough of them for a strong conviction that they all lie within the chemical and physical nature of the organism, acting and reacting in correspondence with the immediate environmental factors amid which the organism lives and develops. At least the conviction of modern biology and psychology is that surely eighty or ninety, and probably one hundred per cent. of the behavior of the organism is due to these factors. You do not necessarily have to be a mechanist in philosophy in order to accept this as an adequate explanation of the behavior of organisms, even human beings.

But mechanist or not, if the biological sciences have thus furnished us an adequate ground of explanation for even eighty or ninety per cent. of the behavior of the organism, the very law of parsimony makes it a sheer waste of time and a defiance of logic to call in such extraneous forces as the influence of the planets and the stars. They have no business mixing up with human behavior; they had better tend to their own affairs; there is no need of having the stars or planets put their fingers in the psychological and biological pies. Too many cooks spoil the broth.

It would seem that a sense of dignity alone would give cultivated people who believe in and practise astrology a bit of misgiving from the fact that the English law for more than one hundred years has classed them as "rogues and vagabonds," that is, where they make any pretense of foretelling the future; and this is the chief thing they do. Some "schools" claim they merely analyze character, but in doing this from the birth-date, which is their chief basis of calculation, they are in reality foretelling destiny. I have never known an astrologer who was not in reality a fortune-teller; they are constantly prophesying good or evil from the positions of the stars. While it has not been tried, I feel perfectly certain that the relative positions of the ocean steamships or the relative prices of wheat, corn, cotton, lard, butter, eggs, shoe polish and hair tonic would yield just as good "mathematical" results.

In a number of American states an astrologer who foretells the future is deemed guilty of a misdemeanor and is subject to jail and fine. According to the Society of American Magicians there have been thirty-nine arrests and thirty-nine convictions under the New York law during the past twelve months. A number of those convicted used astrology as at least a portion of their technique.

I commend also to the attention of the astrologers the following item clipped from the *New York Times* of July 18, 1931, and reproduced here by permission. The italics are my own.

> ### POLICEWOMAN TO HEAD DRIVE ON SOOTHSAYERS
>
> *Mulrooney Names Mrs. Sullivan to Act with Magicians' Group in Exposing Fortune Tellers*
>
> The campaign against fortune tellers, palmists, mediums, clairvoyants and others who are reported to be taking more than $25,000,000 annually from New Yorkers will be handled by policewomen and Police Commissioner Mulrooney has appointed Mary A. Sullivan, head of the bureau of policewomen, to take charge, it was announced yesterday.
>
> Mrs. Sullivan will work with the Society of American Magicians, which complained against the operations of "quacks." Julien J. Proskauer, a trustee of the magicians' society, said he had written United States Attorney General Mitchell asking that a ruling be made as to the legal status of astrologers. Mr. Proskauer said that his society wished to place them in the same category as fortune tellers, who may be prosecuted.
>
> On Monday morning Mrs. Sullivan will confer with leading members of the magicians' society on a plan of action. The policewoman, who has the rank of a first-grade detective, has been active for several years in the arrest of fortune tellers, mediums and others.

It would surely seem that some doubt of the validity of their dogmatic claims might occur to persons with any intellectual self-respect, any desire that truth may prevail, when none of these claims has ever been put to the test of rigid statistical analysis, and when the policeman on the street corner is pleaded with to arrest them for the sake of public decency in a civilization founded on science.

To be sure, the astrologers strenuously, even hysterically, argue that they should not be classed with clairvoyants, palmists and the like. One reason for their objection is that they "use mathematics," that their character analyses and horoscopes are in the highest degree mathematical and can not, therefore, be impugned.

I have taken the trouble to examine a great deal of the so-called mathematics used by astrologers in building their horoscopes. It is the most ordinary arithmetic. Their vast mathematical computations can be made by any fairly bright high-school boy who has had the usual desultory training. Such things as the higher refinements of integral and differential calculus and the formulas of advanced statistical procedure, by which alone scientific truth in these complex fields can be achieved, are as utterly beyond their intellectual training and mental grasp as Compton's equations on the structure of light or Planck's *h*, or Spearman's *g* or Thorndike's CAVD, are beyond the comprehension of any human intelligence, however acute, that has not been specially trained.

Some of these formulas and functions I understand, Manstreet, and some I do not. That is not the point at issue. The point is that if I were setting out to prove a theory of mind and nature, I would regard myself as a proper laughing-stock of scientific men if I did not avail myself of the assistance of such trained men as these and of their very highest refinements of mathematical and experimental procedure, before I would consider I had arrived at satisfactory scientific conclusions, and certainly before I would proceed to practise them on an innocent public in a way that might affect their lives and fortunes.

With all these methods and refinements I might even then be wrong, because, as I have said, the scientist is nearly always wrong. I should, therefore, consider myself as morally culpable—profoundly so—if I did not avail myself of the methods that hundreds of intelligent men laboring for hundreds of years have devised by which truth and error can be put to the best test that the human mind has been able to devise. This is my chief point of antagonism toward all sorts of cultists, astrologers, palmists, character-analyzers, theosophists and the whole vast series of pseudoscientists: namely, that they do not realize the moral responsibility of intellectual honesty. I hesitate to say this because so many of these people—the vast majority—are, individually, such fine and lovable persons. Many of them are fine in manner, gentle, true and considerate as friends, heroic in the performance of the ordinary moralities of life, cultivated in speech and widely informed in many fields of artistic truth; but with all this, they are nevertheless the enemies of that scientific truth for which I am pleading, and which has done more and will do more to make men happy and to make society beautiful and tolerant and free than all things else within the range of mental achievement.

The simple fact is that astrology and all forms of pseudoscience belong with that age-old desire of man to get something for nothing, to get more out of the universe than there is in it, for man to eat his cake and still have it. One of the curious anomalies of all these efforts to foretell coming events by astrology or palmistry or coffee grounds or playing cards is the intimation that if we know in advance what is going to happen we can prevent it from happening! Such a situation is bristling with so many logical contradictions and possibilities of metaphysical and transcendental ambiguities that a humble scientist would not dare enter the arena. I note, however, in my philosophical dictionary that Immanuel Kant, who has for some time enjoyed the reputation of being a rather clear-headed man, employed the word *transcendent* "to denote what is wholly beyond experience, being neither given as an *a posteriori,* nor an *a priori* element of cognition—what therefore transcends every category of thought." It may be that is what astrology is. And it may be it is sheer bunk. I am sure Kant so regarded it since Kant was the best qualified man in science of any of the German idealists. So has astrology been regarded by every great mind—or small one either—that has become acquainted with the methods of scientific thought. Astrology certainly does transcend every category of common sense as well as every category of our experimental knowledge of nature.

In conclusion, however, as I said in the beginning, my chief concern is for the mental outlook and the ethical and intellectual integrity of our rising generation. If they do not absorb utterly the scientific view of life and the world, I honestly fear they will take the instruments of science and blow the world to pieces. According to the *Scientific Monthly* one-fourth of the citizens of Los Angeles, California, many of whom have got rich out of science, are definitely leagued together in various cults for that very purpose. They have no comprehension of the very intellectual approach to nature that has made them rich. And I can scarcely believe that Los Angeles is exceptional as a rendezvous of bunk-shooters and half-educated devotees of humbuggery.

John Mulholland, the scholarly magician and warm friend of the great Houdini, who spent his life fighting spiritualism, astrology and all forms of sham and hokum, has endeavored to estimate the amount of money spent by the American people for the numerous types of fortune-telling, character-reading and the like. By taking districts in a number of cities and canvassing them carefully, he estimates roughly that it amounts to at least one hundred and twenty-five million dollars a year. Since the five-and-tens now sell specially prepared books on astrology and nearly every city block has a number of professional fortune-tellers and bunk-purveyors, and the radio has become a means of advertising their hooey, my own guess would be that the total is not far from half a billion. Mr. Mulholland estimates that in the city of Chicago not far from one-fourth of the radio time devoted to the spoken word is now given over to astrology and various forms of pseudoscience.

However far wrong these figures may be, the situation is an ominous one. My chief hope, I repeat, is the scientific education of our youth. The cultivated wife of a Yale professor startled me of late by asking how old most believers in astrology were. I told her I had no vital statistics, but all with whom I was personally acquainted were over thirty, and most of them over forty. She said she had observed that up to twenty or thirty years ago the literary courses in our colleges were much more popular than the scientific. Young women especially took the literary courses, and if they went through college and came out with the degree of B. A., they knew little about science. Her observation had been that such persons, while often highly cultivated in literature and the arts, still were easily gulled by astrology, fortune-telling and all forms of pseudoscience, including psychoanalysis and character-reading in their crassest forms.

I was deeply impressed with this observation and have found that it stood the test. Now that the scientific courses have become the most popular ones in our colleges and universities, I comfort myself, Manstreet, with the hope that we shall be able to preserve the mental integrity of our youth. Since it was the advent of science that has thrown astrology out of every respectable institution of learning in the Western World, this fact gives us confidence that by scientific education we can throw it out of the minds of men and women everywhere and substitute fact for fancy, truth for error, and furnish the minds of the rising generation with sound views of life and nature based on both science and common sense.

Chapter XIII

You are wrong if you believe

THAT A MOTHER CAN BIRTHMARK HER CHILD

This is one of the oldest and most unfortunate of human superstitions. It is completely exploded by the mere fact that there is no nervous connection between the mother and the unborn child; and we know of no way by which nervous impressions travel except along the nerves. That is, unless you call in telepathy; but in a later chapter I will show how flimsy are the proofs so far furnished to support a belief in telepathy. It is extremely fortunate that nature has protected the child from either the frights or the foolish impulses of the mother and, if telepathy is untrue, has protected it also from the foolish impulses of both the father and the neighbors! If unborn children were subject to such outside influences, nearly every child born would be a monster. Let us be thankful, Manstreet, that this, like all other popular notions, is without foundation in fact.

CHAPTER XIV

You are wrong if you believe

THAT YOU CAN "DISCIPLINE" YOUR MIND AS A WHOLE

If you have done me the honor, Manstreet, to follow these discursive reflections up to this point, you have no doubt observed throughout a glaring and often painful lack in the author's education. Since you are a man of intelligence and spirit, and no doubt purchased this book with the supposition that the author possessed somewhat above the average breadth, depth and continuity of education, I feel some explanation is due you. Of course I might invoke the time-honored legal maxim, *caveat emptor;* but this isn't "done" between friends.

Needless to say, the chief cause of the gaps in my education is a natural limitation. But, aside from that, of which the less said the better, one of the major reasons is that throughout nearly all of my high-school and college courses I was compelled to study Latin and Greek. This naturally prevented me from learning anything worth-while that might be useful in our present civilization. For three years I was compelled to "take" Greek three hours a week, and for five years compelled to "take" Latin five hours a week. It meant that as a minimum requirement I was forced to spend eight hours every week in a room with a group of some twenty or thirty similarly unfortunate young men and women, where vocal sounds purporting to have been uttered by these ancient peoples were bandied about, chiefly by the professor, in his vain efforts to induce the students to reproduce these respiratory and perspiratory verbosities. Of course this did not include two or three times as many hours which I was forced to spend in preparation so that I might play a not too disgraceful part in this solemn educational ritual.

You can readily see that all this expenditure of time and energy left me with neither time nor energy to learn very much about my own language—a knowledge of which I am desperately in need at the present moment; nor did I have the time or strength after trying to get a little sleep and a little tennis and baseball and sailing to learn much about science or history or economics or accounting or mathematics or to study the social life and problems that were immediately about me, or to learn the art of understanding and getting along with other people, or even to learn the one supreme object of all formal education, namely, *how to study.*

The professors were sincere men and worked hard and faithfully in this educational treadmill. They had an educational theory which is still clung to with pathetic persistence by the members of the American Classical Association and by those who have not followed the developments of the past generation in educational psychology. This theory is still almost universally held by the popular mind. It maintains that the exercise of the mind on any difficult form of material *exercises the mind as a whole,* sharpens our wits in general, and enables us the better to grasp all sorts of life's problems. Indeed we were put through exercises in Latin and Greek and geometry and algebra not because anybody believed we would ever have much use for the knowledge that might be gained, but because of the "mental drill" that came out of the process. In short, we were told that the chief value of this type of mental activity was that it "disciplined the mind" and "improved our mental faculties."

It is a bit disconcerting, and I imagine would considerably upset our old Greek and Latin professors, and our geometry and algebra professors as well, to learn that psychologists now believe we have no mental faculties! In those days the mind was divided into such faculties as attention, memory, imagination, reason, will, temperament and numerous other "powers." Each of these powers was believed to be distinct from the other powers of mind. It was also believed that it was possible to find certain studies that would improve all or many of these faculties at once. Prof. Arthur I. Gates of Columbia University has collected a number of quotations from educational authorities supporting these beliefs down to twenty-five years ago. They are still held very passionately in many quarters. The following are some of Professor Gates' quotations: "Study of Latin trains the reason, the powers of observation, comparison and synthesis"; "Pursuit of mathematics gives command of attention" and results in "the strengthening and training of the reasoning power"; "for developing the character, strengthening the will and cultivating a wholesome temperament there is no discipline superior to athletics." As Professor Gates further points out, we have nowadays the same ideas obtaining in the widely sold commercial systems for training memory, concentration, will-power, social adeptness, originality, imagination, poise and so on.

All of these conceptions were well-nigh undisputed before the advent of the educational psychology of the present century and were known as the "Theory of Formal Discipline."

The theory that is now chiefly in possession of the educational field is in the main a denial of this view of the nature of mind and of the learning processes. Gates calls the present theory "The Theory of Mental

Reactions.''* I have just had the good fortune to spend a morning at Los Angeles, with Prof. S. I. Franz and Dr. Ellen Sullivan of the University of California, discussing this feature of education, and thanks to the airplane am writing about it only a few hours later in my home in New York. Somehow, I doubt that the airplane would have astonished my Greek and Latin professors more than the break down of their cherished opinion that they were improving my ''power to think'' by unraveling the mysteries of periphrastics and pluperfects and other linguistic intricacies, which seemed to them to have been almost providentially devised by the ancients for this express purpose.

The psychologists just mentioned, as well as Professors Gates and Thorndike and scores of others whom I have consulted, believe that the theory of formal discipline in the old sense is, as Doctor Franz expressed it to me, ''unacceptable.'' The modern belief is that when we exercise the mind upon one kind of material, let us say, Latin, or repairing door locks, or playing basketball, we improve in the facility for doing these particular things. But they believe the evidence indicates that there is very little ''transfer'' of this training to other mental functions. A very large number of highly refined experiments have been performed to try to measure how much transfer there may be from the improvement of one mental function by exercise to the improvement of another mental function that has not participated. The transfer is so small in most cases that it is hardly measurable, and in some cases, according to Gates, the exercise seems actually to *impede* the readiness of learning in other functions. They do believe, however, that when you have two activities with *common elements,* training in one is beneficial to the other, *to the degree in which the elements are common.* Some new developments in neurology, which Doctor Franz informs me he is soon to publish and which, for that reason, I am not privileged here to recite, seem to give new evidence to this point of view.

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*See Bibliography at end of chapter.

I believe I can illustrate the entire doctrine by a very astonishing experience I had some time ago in teaching a boy to skate. I remember the years of painstaking effort it took me, as a boy, to learn to become a fairly good skater, especially to execute some of the fancy "flubdubs" that were current at the time.

Last winter I had occasion to take out on the ice a boy of fourteen who had never had ice skates on before. I had no thought but that I would have to hold him up and almost carry him around for the first few hours of lessons. That had always been my experience. To my utter astonishment, as soon as we put on our skates, this lad started off with the utmost ease and grace, and in a few minutes was executing most amazing figures which I had every reason to suppose would take years of practise. For a moment I believed the boy had been lying to me, but the whole mystery instantly resolved itself when I learned that he was an expert on roller skates!

This was an instance where the *common element* was well nigh one hundred per cent. Roller skating and ice skating are almost identical physical and mental performances.

Now Latin is no doubt of some use in learning English, but this use is chiefly confined to those words in English that are derived from the Latin. Even here the memory of the Latin soon fades, and with most mature people becomes only a trace. So I do not imagine my years of Latin study have helped me a twentieth part as much as my professors fondly hoped.

If only I could have spent those years in a *direct study of English!* Every day I have to use English. Nearly every day I try to improve my use of it. The immediate study of my mother tongue during those college years would have been of inestimably greater value to me than the hours devoted to the dead languages.

However, the core of the theory of formal discipline is that these difficult mental exercises discipline the mind as a whole and improve general thinking or reasoning powers. This hope has been found justified to a small extent only. The largest scale experiment to test it was carried out a number of years ago by Professor Thorndike, who has been a research leader in so many of the problems of education. Thorndike endeavored to find out by tests upon thirteen thousand five hundred pupils in grades 10, 11 and 12 to what extent a year's training in each of many high school subjects would increase the ability of the pupils to perform tests that involve "selective and rational thinking." Without relating the details of the experiment Thorndike found that training in cooking, sewing, stenography, dramatic art, Latin, French, chemistry, biology, algebra, trigonometry, etc., all had about the same degree of influence in improving the "reasoning powers."

All these newer developments are just as profoundly related to the problem of building character in young people as they are to the training of the reasoning powers. The most remarkable outcome of studies on the training of character has been to discover how astonishingly specialized our character habits are. A man may pay his gambling debts as "debts of honor," and neglect his grocer; he may be scrupulously honest in business, yet lie to his wife without a twinge of conscience. These conceptions have been formulated by Doctors Hartshorne and May in an important study of the character habits of over ten thousand school children in a doctrine which they call the “specificity” of character habits. Any one responsible for the training of character in children should study these volumes with great care, for I believe they bring us at last in sight of the true methods.

The problems are too long and involved to describe here, but the chief conception that emerges both for intelligence and character training is that the method is more important than the material. If a person can learn certain habits of study that have been proved by experiment to be helpful in one study, the benefit when applied to any other study is extremely gratifying. Prof. Robert S. Woodworth, of Columbia, one of the most eminent of living psychologists, performed an extensive experiment that brings this out with great impressiveness. As related by Gates, he tested three groups of students of equivalent initial ability in memorizing several kinds of materials. One group, the Practise Group, went at the test, by main strength and awkwardness, without any suggestions or instructions. One group, the Control Group, was given no training at all. A third group, which Woodworth called the Educated Group, was given not only practise in memorizing but was carefully instructed concerning good methods, and how to use these methods in improving ability to recall the material. The results were that the Educated Group made ten times as much gain as the Practise Group. Both groups were compared with the Control Group, so as to determine the degree of improvement over the original ability.

The outcome of this and numerous other experiments indicates clearly that we can enormously improve ourselves by education. While the old theory that we discipline our minds as a whole by any one set of exercises in intellectual or moral training is doomed to disappointment, the belief that by using improved methods of activity we can do far better than the older educators in either of these fields holds out large hopes of personal development. The notion that you can build up a good memory and become a walking telephone directory by a few correspondence lessons is a false notion; the notion that you can build up a tremendous will power by a few exercises in self-assertiveness is as little justified. It is not as easy as that. The will is simply a set of habits, as one of my psychological friends, Dr. David Mitchell, defines it. By going through a sufficient number of definite mental procedures in a certain desirable direction, such for example as making a list of your successful performances instead of mulling over your failures, comparing your good points with those of other people instead of your bad points with the good points of others, you can enormously strengthen your habits in that direction, in other words, strengthen your will power. And in any situation that has common elements these habits will come to your aid.

The same principles are true of all learning. You can learn certain methods and tricks of the trade which can be applied in an enormous number of situations. Just because the theory of general mental discipline has not justified its hopes does not signify that education and mental effort will not bring extraordinarily gratifying results. Learning moral habits is just a part of all learning. Character training and mental training are in the end the same. Both depend on learning how to use the mind on concrete situations. There is nothing magical, nothing, indeed, extremely difficult about it. We learn by learning and can greatly improve our methods of learning. We do by doing and can greatly improve our methods of doing. By careful study of means and consequences, and by using the best learning methods that the experts (that is, the *real experts* in education who usually are not the advertising experts) have devised, we need set no practical limit to self-development.

Even if one improvement does not improve us as a whole, there are such an infinite number of lines of improvement that education, provided we keep at it, is an exciting life-long adventure. Rarely does any one reach the limit of training in any complex field, whether it be typewriting or playing the piano or repairing automobiles. As Gates suggests, even in the matter of shaving or tying neckties we seldom reach the limit of efficiency. And in the general processes of life, such as keeping house or entertaining our neighbors or practising law, there is no limit to our possible improvement. This is just as true in our habits of character as in our purely intellectual habits. While our old Latin and Greek and geometry professors had inefficient methods, we can learn much from them because, at any rate, they had noble ideals. And just in proportion as we build up a wide range of useful and socially beneficial habits do we set for ourselves wider and larger ideals. We do not achieve ideals suddenly. They are the outgrowth of deep and persistent striving in many directions. And, Manstreet, to arouse in our youth these habits of continued striving, and to supply them with the best techniques that experiment can devise, is the inspiring and hopeful task of both intellectual and moral education.

NOTE: To those who may wish to pursue this important problem of the Formal Discipline Theory and the Reaction Theory of education I should recommend the following course of reading:

1. Arthur I. Gates, *Psychology for Students of Education* Revised Edition, Macmillan, New York, 1930. One of the very best and most readable books on education written in many years.
2. Edward L. Thorndike, *Educational Psychology,* Sec. Ed. Teachers' College, Columbia University Press, New York, 1910.

3. Edward L. Thorndike, *Human Learning,* The Century Company, New York, 1931. A book of great significance and immense background.
4. Hartshorne and May, *Studies in Deceit, Studies in Service and Self-Control,* and *Studies in the Organization of Character;* being a report of the *Character Education Inquiry* of Teachers' College in cooperation with The Institute of Social and Religious Research, three vols. Macmillan, 1929 and 1930. In vol. II the authors were assisted by Julius B. Maller and in vol. III by Frank K. Shuttleworth. The researches in character, its nature and organization, contained in these volumes constitute an epoch in the history of human education.
5. W. C. Bagley, *Determinism in Education,* Warwick and York, Baltimore, 1925.
6. Nellie P. Hewins, Ph.D., Pd.D., *The Doctrine of Formal Discipline in The Light of Experimental Investigation,* Warwick and York, Baltimore, 1916.
7. William Henry Pyle, *Nature and Development of Learning Capacity,* Warwick and York, Baltimore, 1925.
8. K. S. Lashley, *Brain Mechanisms and Intelligence,* A Quantitative Study of Injuries to the Brain, University of Chicago Press, 1929.
9. Donald A. Laird, Ph.D. *Increasing Personal Efficiency,* Harper and Bros. Sec. Ed. 1929.
10. Daniel Starch, Ph.D., *Educational Psychology,* Macmillan, 1927.
11. In the author's two volumes, *The Marks of An Educated Man,* The Bobbs-Merrill Company, 1930, and *Exploring Your Mind,* Doctor Mitchell sets forth a number of exercises and suggestions for improving will power and personality.

Chapter XV

You are wrong if you believe

THAT BALD-HEADEDNESS IS DUE TO TIGHT HAT BANDS

In case, Manstreet, you have the affliction of being bald, I should like to save you at least the price of this book. How many millions of dollars are expended every year for solutions, salves, emulsions and the like in order to cure baldness, it is impossible to calculate. Enough probably to finance some very large educational or social welfare enterprise. I wish we had at least half the money spent on this foolish popular notion to study the heredity of man, to improve his inborn health, intelligence and pulchritude, and indeed to reduce his bald-headedness.

While waiting for that dream to come true I can inform you that no lotion, however strong the guarantee on the bottle that you will get your money back if it does not grow hair on a billiard ball, is going to replace your hirsute adornment in case you have lost it by true pattern baldness. This is the type of baldness that is practically complete over a large area of the skull and leaves only a fringe of hair surrounding the general clearing.

The matter was studied quite thoroughly by Dr. D. Osborn and his results were published in *The Journal of Heredity* in 1916. The research sets forth that pattern baldness is a pure hereditary trait and is what is known as "dominant" in men and "recessive" in women. A dominant trait is one that usually shows rather plainly in the offspring even if it comes from only one parent. A recessive trait does not usually show unless it comes from both parents. The standard example in man of a dominant character is brown eyes, and of a recessive character, blue eyes. The popular notion that two blue-eyed parents have brown-eyed children has no foundation as far as we know. It is as far off the track as all the other popular notions. You often hear people assert that they have seen brown-eyed children from blue-eyed parents, but either they have not examined the eyes of the parents with magnifying-glasses or else, as probably happens in rare cases, the brown pigment in the eyes of one or both of the parents has failed for some unknown physiological reason to develop. But this is a very rare circumstance.

Bald-headedness, as East points out in his book, *Heredity and Human Affairs,* is similar to the inheritance of horns in Dorset and Suffolk sheep. In the Dorset sheep both sexes have horns; in the Suffolk breed neither sex has horns. If now a female of the Suffolk breed is crossed with a male of the Dorset breed, the male offspring all have horns, while the female offspring are hornless. You see horns are dominant in the male but recessive in the female. However, if one of these hornless female offspring is next crossed with a hornless male of the Suffolk breed, although neither parent has horns, one-half of the male offspring will have horns! To explain what goes on in the germ-cells in order to produce these astonishing results is well-known but is too complex to interest us here. The inheritance of a head of hair or its opposite, bald-headedness, in human beings is the same kind of phenomenon. The hairless condition does not show in the mother, because she has received from her parents the necessary chemical packages, called *genes* (pronounced jeans), to produce hair, although one-half of her brothers may exhibit baldness. As East remarks, "A bald-headed man may have received his heritage from his mother, although her tresses were as long as those of the seven Sutherland sisters."*

I simply call this to your attention, Manstreet, in order to show you how expensive in cash and worry your popular notions very often are. There is only one remedy for pattern baldness so far as I am aware: that is to be contented with it. Otherwise the only thing to stop falling hair of this hereditary type is the floor.

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* *Heredity and Human Affairs*, Edward M. East, Scribners, New York and London, 1927.

CHAPTER XVI

You are wrong if you believe

THAT A RED RAG WILL MADDEN A BULL

I WONDER if any popular notion in the whole literature of stupid guesses about the laws of nature is more universally believed than the notion that shaking a red rag at a bull will enrage him. It is a part of our daily speech. It would not matter much except that it often sets up exaggerated fears in the children of rural districts. Almost any reader who has been reared on a farm will recall his utter terror when he passed a field where there was a bull if he happened to have on a red hat or any red piece of clothing. I agree with a psychologist friend of mine that I would rather see physical injury inflicted on a child, even to the extent of maiming it or breaking its limbs, than have a chronic fear set up in its mind. And there can be little doubt that even this trivial popular saying often sets up deep-rooted fears in the minds of rural children.

As a matter of fact the notion is so much bosh. I have just been holding a long talk on the telephone with my friend, Prof. Thomas N. Jenkins of New York University, one of the most eminent animal psychologists in our country. Professor Jenkins informs me that numerous experiments have shown that the higher animals see everything in about the same colors and shades as the world looks to us at dusk. In fact the power to discriminate colors to any great degree is probably a power possessed only by man. The notion that the brilliant colors of the peacock or the rooster or the butterfly or the plumage and hair color of males in general is a device on the part of nature to enable the female to select the most beautiful and "fittest" mate seems to be unjustified. There is probably some degree of sexual selection that takes place in animals, but any fine discrimination of colors, present evidence indicates, plays little or no part in it.

Indeed if we wished more concrete evidence it would seem the height of folly for the matadors in Mexico, Brazil and Spain, to wear suits of brilliant red silk, as they often do, in the bull fights if it is the red *color* that enrages the bull. The matador would hardly wish to wear something that would cause the bull to charge at him instead of the red cloth he is waving in order to get the animal excited.

Mr. Sydney Franklin, the Brooklyn lad who has upset a popular Spanish notion that nobody but a born Spaniard can make an expert bull-fighter, informs me that it is not the red that makes the bull mad, but the fact that the cloth is *moving*. A suit of pink pajamas or a yellow or green table-cloth would excite his anger just as much, provided it were in motion.

It seems likely, therefore, that, while a matador might risk having his skin punctured, he would hardly risk having a five hundred dollar suit ripped up by a maddened bull, even though, as Mr. Franklin states, the experts often receive three or four thousand dollars for exhibiting their art—a species of art greatly appreciated by the crowd, but probably not so enthusiastically by the bull.

So I fear, Manstreet, we shall have to lay this time-honored popular notion on the shelf along with all the other fallacies that result when we guess as to the cause of natural phenomena without adequate experiment. The bull has been thrown again.

Chapter XVII

You are wrong if you believe

THAT WOMEN CAN DRIVE AUTOMOBILES AS WELL AS MEN

This is one popular notion, my dear Manstreet, which we can say is surely dripping with blood. Nearly all popular notions are bloody when the real truth becomes known.

You probably thought it a joke when you noticed the statement that the notion is wrong that women can drive automobiles as well as men. War, too, is a joke if you can look at it from the standpoint of the war god Mars; but from the human standpoint our sense of humor sees it in quite a different aspect. I think we shall find this to be true, likewise, of this world-wide modern habit of turning women automobile-drivers loose (along of course with vast numbers of incompetent male drivers) so that they may freely maim and slaughter other people and lose their own lives on the public highways. If you doubt it, Manstreet, let us look at a few facts.

Between twenty-five thousand and thirty thousand people are killed every year in the United States by motor-car accidents alone. At least one hundred thousand are maimed, many of them being wrecked physically and also mentally for life. This is approximately one-half as many Americans as were killed during the Great War.

And a vast deal of this slaughter, my dear Manstreet, is due to the four following wrong popular notions:

1. That anybody can drive an automobile who wants to;
2. That with equal training everybody can drive with equal safety;
3. That one person is as liable to accidents as another;
4. That women can drive automobiles as well as men.

Since women in general do not seem to enjoy murdering other people, either through carelessness, incompetence or by intention, as much as men, and since a large proportion of this slaughter—nobody knows how much—is due to the last named popular notion, let us examine this piece of truly bloody nonsense first. There are no other terms in which we can speak of the notion when we know the facts.

As I have said, it is commonly taken as a joke when one calls into question the ability of women to drive safely on our highways as compared with men. It is taken as the opinion of a "mere man," or as "just like a man." Perhaps women may be excused for this attitude because more driveling nonsense has been written about what kind of human behavior is "just like a man," and what is "just like a woman," by our novelists, poets, philosophers and orators, than about any other subject within the range of human misinformation.

The simple fact is that, outside a few experiments in the laboratories and a few quite general observations of doubtful validity, nobody knows a thing on earth about the differences between men and women or indeed whether there are in reality any very deep-seated inborn differences between them. Probably there are considerable differences, particularly in the emotional reactions and attitudes of males and females; but whether these differences are due to environment or heredity, to differences in training, interests, social customs and ideals, or to differences in constitutional make-up, is almost entirely unknown. As with all other questions of fact we shall never be able to reach any sound conclusions until somebody finds out the facts by analysis and experiment. And this is something that, except for a few laboratory experiments in speed reactions, intelligence tests, school grades, and like matters, and one quite large and significant investigation now in process at a leading university, nobody has seriously tried to do. At least nobody has tried to do it by methods by which scientific truth may be ascertained.

It happens, however, that an extremely important investigation has recently been carried out on the problem of the relative safety of women automobile-drivers as compared with men. The investigation, the main facts of which I wish to recite to you, was made by Prof. Morris S. Viteles, Assistant Professor of Industrial Psychology, of the University of Pennsylvania with the aid of one of his graduate students, Helen M. Gardner.

These data were published in the *Personnel Journal,*[1] and the editor characterizes the conclusions that were forced upon the two investigators as nothing short of "astonishing."

The first thing Professor Viteles and Miss Gardner did was to review a number of investigations already made. One of these, taken from the *Service Bulletin* of the Research Department of the American Automobile Association, is presented in the following table:

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[1] *Journal of Personnel Research*, 29 West 39th St., New York. Organ of the Personnel Research Federation, February, 1929, Walter Van Dyke Bingham, Editor.

Comparison of accidents to men and women automobile-drivers; District of Columbia (1927)*

	Men	Women	Unknown	Total
Licensed Operators ...	104,565	18,435		123,000
Non-fatal Accidents ...	4,092	282	329	4,703
Fatal Accidents	76	2	5	83
	Per cent.	per cent.	per cent.	per cent.
Licensed Operators	85	15		100
Fatal Accidents	91.6	2.4	6	100
Non-fatal Accidents ...	87	6	7	100

It is evident from this table that the men drivers had a far higher percentage of accidents than the women, both fatal and non-fatal. Whereas eighty-five per cent. of the drivers were men they had eighty-seven per cent. of the non-fatal accidents and over ninety-one per cent. of the fatal accidents. The women on the other hand constituted only fifteen per cent. of the operators but had only six per cent. of the non-fatal accidents, and only a little over two per cent. of the fatal accidents.

These results are obviously highly favorable to the women; that is, they are "obvious" to any one except a trained statistician.

Doctor Viteles and his assistant reviewed a number of other investigations, all of which indicate that women are at no disadvantage in driving automobiles. For example, in San Francisco a study of one thousand fatal accidents showed that whereas the women held twenty per cent. of the driving licenses in that city, they were responsible for less than five per cent. of those killed in motor accidents.

In Massachusetts a report by the Registrar of Motor

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*Reprinted by permission from the *Personnel Journal*, Vol. VII, No. 5, Feb., 1929.

Vehicles shows that, whereas approximately twelve per cent. of the licenses were held by women in 1927, only about three per cent. were involved in fatal accidents. Again, a similar report from the state of Connecticut for 1927 shows that, whereas about twenty per cent. of the drivers' licenses were held by women, they were involved in less than ten per cent. of the accidents.

The only report that Viteles and Gardner examined which seemed to run contrary to the foregoing is contained in a letter to them from the Statistician of the New York State Department of Taxation and Finance, who wrote:

> "From tests which I have made of twenty thousand registrations we find that the percentage of accidents in which women are involved bears the same relation to the number registered as is the case with the male driver."

From this report it seems clear that, if the statistics from all the communities mentioned have in reality been properly gathered and have received valid statistical treatment, the women of New York are far more dangerous on the public highways than the women of Washington, Massachusetts and Connecticut!

In response to an inquiry of my own with reference to the relative safety of men and women auto-drivers I received the following letter under date of May 21, 1931, from the Commissioner of Motor Vehicles of the State of New Jersey:

> "For your information I would advise that during the year 1930, out of 35,258 drivers involved in accidents, 3,111, or 8.8% were women. There are 710,500 men licensed to drive in New Jersey, as against 304,500 women, so the approximate per-

> centage of men in accidents is 4.5, with only one per cent. of women in accidents in proportion to the total number of women who are licensed drivers.
>
> "These are the only actual statistics available, and I trust they will be some help to you."

I wonder, Manstreet, if you ever took the trouble to examine some of the so-called "statistics" contained in the *Congressional Record* or in some of the widely advertised Wall Street market reports and predictions. All the foregoing statistics with the exception of those from New York remind me very forcibly of a large proportion of the alleged facts and figures issued by these eminent "authorities" on statistical science. They also remind me forcibly of Shakespeare's "corridors that lead to nothing." However, the investigators whose work I am reviewing state their attitude in the following much more cautious words:

> "Although the burden of evidence of these studies is in favor of the women drivers, however, it is subject to certain limitations which make it impossible to draw from it the conclusion that women drivers are safer drivers than men. Among these limitations are the following:
>
> "1. The evidence fails, in the first place, to include a comparison of accidents per mile of driving. It is safe to assume that the average number of miles covered by male operators is considerably in excess of the average number covered by women drivers.
>
> "2. It also seems reasonable to assume that, on the whole, men operate under more unsatisfactory driving conditions than do women. A greater proportion drive in heavier traffic and in stormy weather than is the case with women.
>
> "3. Only male drivers operate trucks and other

> heavy vehicles, in the case of which the proportion of accidents is greater than among lighter vehicles.
>
> "4. It is possible, although this may be difficult to demonstrate, that the mechanical condition of machines driven by women is, on the average, better than those driven by men. It seems true that the second-hand cars are more often bought and operated by men than by women.
>
> "It is with a purpose of avoiding such variables that the study described immediately below was undertaken."

It seems painfully clear that any conclusions drawn from the type of investigations carried out by the highway commissions previously quoted are bound to be absolutely worthless. For example, if you have one hundred men drivers and one hundred women drivers and you find that the men kill ten people and the women kill five you are no wiser than you were before as to whether it is safer to ride with a woman driver than with a man. If the men drive one thousand miles to every one hundred miles driven by the women, the women obviously have only one-tenth as many chances to kill a person as the men. Also if the women drive only in good weather and drive newer and better machines, which they probably do on the average, you give the men an additional handicap. In short *you don't know anything.* And it is just by such loose thinking that practically all popular notions arise and cost humanity so very much in life, property and happiness.

These investigators were fortunate in having available very exact data on a large group of men and women taxicab-drivers in a large eastern city covering an entire year of operation and over twenty-eight million miles driven by men and nearly three hundred and fifty thousand miles driven by women. The data enabled them to make comparisons where the following four conditions were nearly identical:

1. Type of vehicle operated,
2. Mechanical conditions of the taxi,
3. Weather conditions,
4. Traffic conditions.

The women may have been slightly favored by the fact that only new cabs were assigned to them. The men may have been slightly favored by the fact that the women did not drive at night. It is a popular notion that city driving at night is more hazardous than day driving. But the investigators found the higher accident *rate* occurring during the day, although the night accidents were more serious. The women were also given the rather easier districts. Another thing perhaps slightly favoring the women was that they were given a great deal of additional training after being hired. Some of the extra ratio of accidents by the women may be due to their not having been quite as experienced as the men; but only a small proportion of the women were inexperienced, and of course, none was given a cab to operate until she was thoroughly trained.

If you really wish to be informed on this question, Manstreet, I shall be forced here to urge you to study the following figures with considerable care because they bear on a very important national problem. The total number of miles driven by the men was 28,431,719. The total number of accidents by the men was 7,311. If you divide the former figure into the latter the result is .000257 (the average accident per mile). This means there was practically twenty-five one-hundredths or one-fourth of an accident per one thousand miles, or one accident for about every four thousand miles driven by the men.

Now, on the other hand, the women drove a total of

348,979 miles. While driving this distance they had 268 accidents. If you divide 348,979 into 268 it gives you a result of .000767 (the average accident per mile). This means that the women had three-fourths of an accident for every one thousand miles driven. To find out how far the women had to drive for a full-sized accident all you need do is divide .767 into 1,000. This shows that the women had a regular for-sure accident for every 1,303 miles driven. Since the men had to drive 4,000 miles to have an accident, you can see that, when women are driving under approximately the same conditions with the same kind of machine, it is about three times as dangerous for you to ride with a woman as with a man at the wheel. This assumes, of course, that the man is not so much interested in the woman that he fails to pay attention to his business!

These investigators also calculated the ratio of male and female accidents for every $1,000 collected in taxi fares by the company. They found the women had 5.06 accidents for every $1,000 revenue, whereas the men had 1.44 accidents for every $1,000 in taxi fares. Dividing 1.44 into 5.06 the result is 3.49, which means that the women had approximately three and one-half times as many accidents as the men per one thousand revenue to the company.

Another comparison of great interest made by these students was the relative total cost in claims for damages, etc., resulting from the male and female accidents. This part of the investigation was not so conclusive because the relative accident costs of the men and women drivers covered only one month, and did not include legal expenses or the cost of claims that were still unsettled at the time of the investigation. However, the comparison is extremely suggestive, and in it the women come off much more favorably than the men. The result showed that during this period the cost for settled claims due to women was $15.76 for every $1,000 in revenue and the accidents due to men $31.83 for every $1,000 in revenue, or over twice as much. It showed also that the cost of accidents per 1,000 miles driven was only $2.68 for the women and $5.77 for the men, or over twice as much. While this does not make up for the fact that the women had nearly *three times* as many accidents, yet in the words of the ivestigators: "These last named results, do suggest that the accidents in which women are involved are, on the whole, less serious than those in which men are involved. This evidence is in favor of a not uncommon opinion that women, through over-cautiousness, cause accidents on the part of fellow drivers. In such accidents the women drivers involved naturally have no damage charge against the vehicle operated by them. This is possibly borne out by the fact that the proportion of accidents followed by claims (in this particular period at least) is smaller in the case of women than in the case of men drivers." Of course, where women by over-cautiousness cause another person to have an accident no claim would be brought for damages to their own machine.

Summing up the entire investigation, Professor Viteles and his assistant draw the following conclusions:

> "The figures obtained in this comparison of men and women taxicab drivers favor the point of view that the present generation of women drivers is more susceptible to accidents than the present generation of men drivers. The extent to which this is the result of relative inexperience in driving, or of a sex-determined difference in susceptibility to accidents in traffic, can not be finally determined from an examination of the present data. The fact, however, that a sampling of women

suffer more accidents when driving under the same conditions as a somewhat similar sampling of men is clearly established."

I think this investigation does establish clearly the fact that women drivers are on the average far more dangerous on the public highways than men where conditions are approximately equal. There can be little doubt that women have as few accidents as they have not because they are superior drivers, but because they usually drive machines in better repair, do not drive in all sorts of rough weather, and do not often drive buses, trucks and heavy machines. Consequently in gross state statistics they show up far more favorably than they deserve. But put the same number of women drivers on the highway as men in the same types of machines, and it is safe to assume that women are at least twice as likely as men to cause accidents.

We are left with the impression that under ordinary conditions women drivers in general may be even more dangerous to life and property than was the case in this investigation. The inference is suggested by the fact that these women taxicab drivers were given very careful training under standardized conditions and were highly selected by various tests at the start. Women in general undergo much less stringent selection than these particular taxicab drivers, and, in the various states, are given all sorts and types of training, ranging from indifferent and perfunctory to fairly good. The same may be said of men. But it certainly suggests that women should not only be far more carefully selected than they are, but should also be *far more carefully trained than men* before they are allowed to drive. This is especially true for those countries where there is an increasing tendency to employ women as truck drivers, bus drivers and even street-car drivers.

It also bears upon the rapidly approaching problem of the training of women as airplane pilots. There can be little question that they should have a considerably longer training than is necessary for men.

You may, my dear Manstreet, bring forward the objection that you are personally acquainted with plenty of safe and sane women drivers, and your women friends will likely be even more positive about it. But here again is your old habit of noting the exception to the rule. I know a good many safe women drivers myself. It might easily be that in a town of five thousand people the best driver is a woman, and the worst a man. It is not very likely, but it might be true. This is because the differences between good and bad women drivers and the differences between good and bad men drivers are far greater than the differences between men drivers as a whole and women drivers as a whole. But it only emphasizes the fact that there should be vastly greater care and much longer and more intensive training given to *nearly all men and women alike* before they are allowed on the highways.

Remember that the railroads compel a fireman to take a three-year apprenticeship before he is allowed to handle the throttle of a locomotive, and contrast this with our vast national recklessness and carelessness in the handling of motor-cars. Many railroad engineers have assured me that it is more difficult to drive an automobile than a locomotive. This is something we can not decide with any assurance; but certainly the conditions of locomotive driving are much more uniform. I, for one, should not be averse to a requirement in all states of at least *six months training* under experts before a license is ever issued to *any* person to drive a car on a highway. Even this training should be given only to those men or women who have shown by preliminary tests that they possess the *inborn aptitudes* that make it likely they will become safe and successful auto-drivers. The period of training might soon be determined to be either too short or too long by extensive experimental education. The great new enterprise of experimental education has never been remotely applied to this immense field of human operations where education combined with natural aptitude is so urgent and important.

This investigation does not prove or attempt to prove that women can not be trained to drive motor-cars as safely as men. There is considerable evidence that suggests they could be trained to drive as well as men, although no one can speak with much certainty. I think, Manstreet, judging from the way your mind usually operates on scientific questions, that you would instantly jump to the flattering conclusion that women do not drive as well and as safely as men because they are lacking in mechanical ability. I shall proceed to explode this notion in the next chapter. There may be other reasons why the average woman could not learn by sufficient practise to become as safe a driver as the average man, but it surely does not lie in her lack of mechanical ability. Nor is there any evidence that the deficiency of women as drivers is due to their being slower than men in "reaction time," that is, the speed with which they react to any physical or mental stimulus such as the flashing of a light, the movement of an object, a sudden noise, the shouting of a command and the like. Hosts of experiments indicate no general inferiority in women in respect of this characteristic which is so important to the safe and effective conduct of life.

It may be that women have inborn physical, mental or emotional characteristics as yet unexplored and unmeasured, such as lack of "nerve" (or even too much "nerve"!), or a feeling of physical inferiority, or a recklessness of life, or a super-regard for life, which make it necessary for them to take longer training to become safe drivers. These are, however, mere guesses and I know of no evidence for or against them.

The fact remains that we have here very strong evidence that the present haphazard methods lead to the selection and training of a larger proportion of women who are dangerous to life and property on our public highways than of men. It is a question of such immense importance to countless people that the expenditure of millions of dollars to bring to light all of the factors involved would be abundantly justified. Certainly as long as the present slipshod methods continue and the notion prevails that anybody who wants to is justified in jeopardizing his own life and the lives of his fellow men by being allowed to handle the wheel of an automobile, we are going to have a vast, ghastly and unnecessary slaughter of human beings on our highways, and an undue proportion of them, I am sorry to say, will be chargeable to women, whom we have been taught to believe throughout all human history are the conservators and not the destroyers of human life.

CHAPTER XVIII

You are wrong if you believe

THAT THE BEAUTIFUL ARE DUMB

EITHER men are frightfully poor pickers or else there is a tendency for beauty and brains to be linked together more often than otherwise. We would expect this on grounds of organic evolution, since as we come up in the scale of intelligence in the animal world, there is a general tendency toward the economy of structure and function which appeals to man's esthetic senses, and which we speak of as beautiful. The horse, for example, is more beautiful than the dinosaur, and the ant and bee are more beautiful than the oyster and the crab. We may find apparent exceptions but the broad general tendency of evolution seems rather obviously to have been in that direction.

In human beings there is probably a slight physiological tendency for general normality and excellence of structure to be causally related to the soundness and normality of the nervous system. Havelock Ellis found in studying one thousand and thirty men and women of British genius that their biographies more often than not spoke of their great physical beauty. I submitted the best pictures I could secure of the fifteen most famous women who ever lived to a number of intelligent people and they voted eight of them as somewhat above the average in good looks. In any town you will find the half-dozen leading men and women slightly above average in appearance. I could submit a great deal of other evidence and have done so elsewhere,* but I think it is largely a matter of selection and not because the brains cause the beauty or the beauty causes the brains. Men have tended to select good-looking women of above average intelligence both for wives and employees.

**The Next Age of Man*, A. E. Wiggam, The Bobbs-Merrill Company, Indianapolis.

While these two qualities may not be organically linked they have been, to a considerable extent, linked together by this selective process, much as a man selects a good engine for a handsome automobile or a handsome automobile for a good engine. At any rate there can be no doubt that by any standards of beauty a thousand intelligent women or men will be above the average in physical beauty. Or vice versa a thousand beautiful women and good-looking men will average in intelligence somewhat above a thousand homely and unattractive ones.

Certainly if men admire beautiful women and they are really more stupid than the average, then, since these will be the mothers of the future, it must follow of necessity that we are trending steadily and rather rapidly toward the production of a beautiful and stupid human race! The tendency, however, is to some extent otherwise; not so strong as I think it might be made by wise eugenical and artistic education. But the tendency I am sure is there and could be utilized much more than it is for the organic improvement of the race in both beauty and brains.

CHAPTER XIX

You are wrong if you believe

THAT THE FEMALE OF THE SPECIES IS LESS MECHANICAL THAN THE MALE

I WISH I knew, Manstreet, how much domestic trouble is caused by various wrong popular notions, particularly those that involve questions of the superiority or inferiority in intelligence, special aptitudes and temperament of the male or female of the human species. I wish also that I knew why two people will often spend their lives arguing on questions that neither one of them knows anything about. I can remember that when I was a boy there was one question about which nobody had any information and which for that reason caused frequent and heated discussions and resulted in positive and abiding convictions, always favorable to the male of the species. It was whether any woman had ever lived who could drive a nail to the head without bending it or mashing her thumb (or her husband's thumb) or who could saw a straight line across a board. One woman in the neighborhood was said to be able to perform these extraordinary mechanical feats which were commonly believed (by the men) to be the superior heaven-sent endowments peculiar to the male. Any masculine reference to this particular woman was always accompanied by the sarcastic comment, "She was a born tomboy anyway!"

On numerous occasions since, when a woman has been engaged in some mechanical operation, such as tinkering a door lock or trying to induce a sewing machine to operate properly, I have seen an irascible male brush her aside and take over the operation with the remark, born of a sense of innate superiority, "Let a mechanic show you how to do that. Women don't know anything about mechanics anyhow!" I am sorry in the interest of our mutual dignity, Manstreet, to have to confess that the male in such cases did not always make good in proving his claims to the possession of superior mechanical genius; but he invariably saved his countenance (and ours, too) by maintaining that if he could not solve the mechanical problem involved, it was idle for a mere woman even to try!

I should like nothing better than to join in this male chorus, yet in the interest of the analytical and experimental sciences I am forced to say that while it may be true that women in general do not know very much about mechanics, this is very far from proving that they could not know even more than men if they should wish to acquire the knowledge. Who knows? It may be that they have something vastly more important to occupy their time than tinkering with machinery, such, for example as raising babies, managing households and keeping the male in paths of rectitude. At any rate, you and I, Manstreet, are going to have to admit that all the recent experimental work reveals the astonishing fact that women have just as much native mechanical aptitude or talent or intelligence, or whatever it may be called, as men have.

I shall not go extensively into the numerous psychological experiments in this field, as they involve many highly technical problems which can be discussed profitably only by professional psychologists. Suffice it to say that a number of tests have been devised within recent years that are believed to indicate pretty clearly whether or not a person is likely to succeed in mechanical operations. Just what the various tests measure in the opinion of their inventors and those who use them in selecting mechanics and engineers, it is not necessary to discuss here. Some of these tests involve the capacity to discern quickly the form and relationships in space of surfaces and objects such as plane drawings or piles of blocks and the like. Some involve the ability to detect by the physical senses very slight differences in the weight and size of objects. In some the subject is required to fit puzzle blocks and bits of patterns together so as to build up a logical and complete object or pattern. It would seem all this bears on the thing we call "mechanical ability." The effort is to test a great many of the motor and visual traits and capacities of the individual. Those competent to speak believe that in this way individuals may be very justly compared with one another in total mechanical aptitude, and that their ability to succeed in practical mechanics may be predicted with much greater reliability than heretofore.

The most significant and ambitious attempt to build up adequate tests of mechanical ability has recently been completed at the University of Minnesota under the direction of Drs. Donald G. Paterson and Richard M. Elliott. In this truly magnificent research covering four years of labor, they have been assisted by Drs. L. Dewey Anderson, Herbert A. Toops and Edna Heidbreder. The results have just been published in a six hundred page volume by the University of Minnesota Press, under the title of the *Minnesota Mechanical Ability Tests*. A copy of this research has been very kindly placed at my disposal by Doctor Paterson and I agree with Doctor Robert M. Yerkes, the eminent psychologist, that it is difficult to speak without emotion of this significant investigation of human abilities.

Such a work is just one more attempt, Manstreet, to enable the common uninformed man to apply science to the problems of life. I have seen so many tragic examples of young men who have gone into electrical and mechanical industries, or who have gone to engineering schools, and after months and years of effort have been utter failures as mechanics. The irony of it is that for several years fairly reliable tests have been available, such as the tests devised by Mr. Johnson O'Connor of the General Electric Company, Doctors Stenquist, Thorndike, McQuarry and other psychologists, by which the probable success of a boy in mechanical fields can be foretold with a great deal of dependability. To these is now to be added the Minnesota research, an inestimable boon to every boy who has ambitions to enter work involving mechanical aptitudes.

To speak of vocational counsel in general, it seems especially tragical, now that such counsel of a very high order can be obtained in almost any large high school, college or industrial establishment that, unless young men and women have very decided and obvious talents for some particular vocation, they should choose their life careers without making every effort to secure the benefit of scientific guidance. It is usually based not only on a great deal of experimentation, but on a wide knowledge of the careers and occupations that are readily available and the types of talent and temperament that tend to succeed in each one of them. But here again it is chiefly wrong popular notions, especially the twin wrong notions that everybody has a right to his own opinion, and that everybody knows his own mind (when as a matter of fact very few people have a right to their opinions, and nobody knows his own mind unless psychological experiments have revealed it to him) which prevent the spread of the useful applications of psychology. Psychologists do not know much, and no one knows it better than they; but what little they do know is of immense importance; and, especially to young people wrestling with the question of the choice of a career, the psychologist can in many cases render incalculable service.

This is certainly true of the mechanical ability tests; and one of their chief services to society is the amazing disclosure that women if they desired or if it should become necessary could make as good mechanics as men in so far as mechanical aptitudes insure success. Whether they could ever furnish as high a proportion of great inventive geniuses is quite another question—a question that involves profound problems in biology and genetic psychology, that is, the psychology of the growth and development of the nervous system. But for all practical purposes, women have shown themselves equal in general mechanical ability to men. I think I can bring no more convincing evidence of the truth of this than merely to paraphrase the conclusions of the Minnesota Mechanical Ability Research.

The research showed that in the assembling of various mechanisms, similar, say, to putting the various parts of a lock together, the women and girls fell far behind the boys and men. A large number of trials showed that university women made about the same scores on tests of assembling mechanisms as seventh- and eighth-grade boys. When the average man sees this sort of thing, as he often does in real life, he at once exclaims that women are poor mechanics. He forgets that at some time of his life, probably in boyhood, he had a great deal of training in handling tools and putting mechanical contrivances together, or at least observing how they worked. Very few women have had this opportunity. The Minnesota investigators, therefore, concluded that this was a test of mechanical *experience* and *training* in the main instead of a test of innate mechanical *ability*. You and I, Manstreet, might consume a whole day in taking a watch apart and putting it together so it would keep time. Possibly, like all the King's horses and all the

King's men, we never could put it together again. Yet we might jumble all the parts in a box and take them to a watch-maker and find that he could put them together in no time at all. People in such a case would say nonchalantly that the watchmaker is a good mechanic and we are not. But this is far from being the only possible conclusion. It might be that we could learn how to take watches apart and put them together in half the time it took the watch-maker to learn how to do it. It was this *learning capacity* that was the chief object the Minnesota students had in mind. They did not wish to find merely what people in general know about machinery, but how quickly and effectively different individuals could learn about machinery and mechanical operations in general. This learning capacity they judged to be, to a considerable degree at least, a measure of inborn mechanical aptitude.

When it came, therefore, to tests that seemed to measure the capacity to learn mechanics, such as tests of speed and accuracy in judging odd sizes and shapes and patterns and fitting them into corresponding places in a form board, or speed and accuracy in packing blocks or in sorting out cards, the girls and women were found to equal and in some cases even to excel the boys and men. Instead of finding in these operations that seventh-grade boys were equal to university women, as they did in the mechanical assembly tests, the amazing thing came out that the seventh-grade girls were equal to the seventh-grade boys. On some of the tests they were equal to the eighth-grade boys.

When we consider all the social pressure that is brought to bear against women working at mechanical operations, especially against their becoming skilled mechanics; when we consider how a girl who takes to mechanical work and wants to put on overalls and tinker with machinery is called "masculine in her tastes'' and termed a ''tomboy,'' it is certainly all the more astonishing to find that on fundamental mechanical performances, where all the conditions were made equal for both sexes, the girls did just as well as and in some cases even better than the boys.

As Doctor Paterson and his associates point out, it is hazardous to speculate on what may be the future social and industrial results of these discoveries which are constantly accumulating and which prove conclusively that women have just as keen and as effective mechanical abilities as men. Before the World War women were given only the semi-skilled jobs in our factories, such, for example, as packing, sorting, inspecting and in some cases assembling of parts. But, during the war when there was a serious shortage of men mechanics and the social pressure barring women from mechanical work was broken down, there was not merely surprise in labor and employer circles, but there was positive consternation at the readiness and success with which women replaced men in many of the most highly intricate mechanical operations. The rapidity with which women learned these skills in itself suggested that they possessed all the necessary native ability, provided our social ideals of the ''dignity'' of mechanical work for women should undergo a change.

We now and then hear a great deal of pity expressed by the American woman for the ''unfortunate women of Russia'' because they have to work at mechanical tasks. We have all heard a vast amount of sympathy extended to the poor farm woman who has to drive a mowing machine or a tractor and help her husband with the mechanical operations about a farm. Whether she likes this kind of work or not, I have no opinion. Yet it may be a justified surmise from this discovery of her natural abilities that many women find working with machinery a great release of their inborn capacities. Numerous researches have shown a fair degree of relationship between one's ability to do a thing well and one's enjoyment in doing it. Children who are unmusical usually hate piano practise. Women who do not delight in cutting and sewing and fashioning dresses dislike sewing intensely. So it may be that, as the public becomes disabused of this notion that women are inferior in mechanical abilities, many women who at present take up sales jobs in department stores, stenography and other office work, not because they like these occupations but because of social and economic custom, may find a real release of innate capacities in the skilled mechanical field and even in the higher fields of engineering. As I have said, whether women will ever supply as large a proportion as men of the supreme geniuses of mechanical invention and discovery, is quite another question, and one that involves other psychological and biological factors. But this fine research by the Minnesota University investigators, when combined with a great many lesser researches into one of the most fundamental and useful of all human abilities, shows conclusively that those who hold the popular notion that the female of the species is less mechanical than the male must bring forward an impressive mass of new data in order to prove their claim. As it stands now, Manstreet, the women have won their case.

CHAPTER XX

You are wrong if you believe

THAT HEALTHY COUSINS SHOULD NOT MARRY EACH OTHER

ABOUT once or twice a week a couple of heart-broken young people write me that they are cousins, and very much in love with each other, and wish to marry, but that their families have separated them. If they are reasonably healthy cousins with reasonably healthy parents and grandparents and great-grandparents, this is all bosh. It is also a tragedy. I have known this popular notion to ruin the lives of a great many healthy-bodied and healthy-minded cousins who wished to marry.

There might occasionally be a defective child from a cousin marriage but Prof. E. M. East, of Harvard, has shown that with reasonably healthy ancestry, there is no more danger of defective children than in the case of other marriages. Even where there is a defective child the cousin marriage does not *create* the defect. Inbreeding, however close, never creates defects. It may keep them in the family but that is all. The Pharaohs, the Incas, the Ptolemies and several royal families of Europe have produced great geniuses by intermarriages within the family. In the Egyptian and Incan royal families there were numerous brother and sister matings. The Bach family produced twenty-eight distinguished musicians in five generations, and much of this was due to cousin marriages. They kept the genius in the family. In good families cousin marriages preserve the virtues; in bad families they preserve and intensify the defects.[1]

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[1] NOTE: The reader who desires more detailed information on this subject should consult the following:

Heredity and Human Affairs, Edward M. East, Charles Scribner's Sons, New York and London, 1927.

The Fruit of the Family Tree, A. E. Wiggam, The Bobbs-Merrill Company, Indianapolis.

CHAPTER XXI

You are wrong if you believe

THAT THE HUMAN RACE HAS LEARNED HOW TO PILE BRICKS, SHOVEL SAND OR BUILD A KITCHEN

I NEVER quite know, Manstreet, whether to believe the human race is pretty intelligent or pretty stupid—a race of geniuses or a race of morons. Of course, this is the only human race I have ever seen and I have no idea how we might compare with races on other planets. When I listen over the radio or ride in an automobile or airplane, I conclude we are pretty bright; but when I see some of the methods of our social organization, the way we distribute our wealth, the programs that our politicians advocate and, to our sorrow, sometimes execute, the schemes of life and nature that some of our thousand and one cultists advocate, I come to the conclusion that our most notable characteristic is stupidity. What astonishes me most and leads me to believe that, after all, we are, as Carlyle said of the citizens of England, "mostly fools," is the fact that ages and ages have been required for human beings to learn the very simplest things and operations of every-day life.

It is truly depressing to learn how slowly the human mind learns. Thorndike says in his latest book, *Human Learning:*

> "The ablest judge of distance of 100,000 years ago could not have measured the height of a tree as accurately as a school-boy can now. At that time there probably was no man living who could tell 100 sheep from 101.

> "They [scientific inventions] also make available responses which were once far beyond man's grasp. With a yardstick a fool can draw a straight line 30 inches long more accurately than the best artist and judge of length can without it.
>
> "We do not have to go back anywhere near 100,000 years to reach a time when a man could have gained great repute as a wizard if on seeing 100 coconuts and fifteen persons, he could predict that there would be 6 per person and 10 left over. If some man of a few thousand years ago had wished to draw a square or a circle to contain ten square units, he could not have done so.
>
> "Man to-day can make connections ending in responses of generating 1,000,000 volts of electricity or letting loose a pestilence, tasks for only Jove and Apollo not long ago."*

Really, if you think about it, Manstreet, you are astounded that man has achieved in science such signal success in some directions and yet remained a moron in so many other directions. As a prime example it seems well-nigh incredible, since piling stones was probably one of the very first of all demands on human intelligence, that men have till now never even tried to find out how to do it in the best possible fashion. Whole races of people have been enslaved, whipped, starved, murdered, in order to compel them to pile stones; yet, notwithstanding the billions on billions on billions of hours and days that men have been forced to spend piling stones, it never even occurred to any one of them, to try to learn better methods of doing it. You would have supposed that even elephants, if they had had to spend centuries picking up a stone here, carrying it a few feet and laying it

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Human Learning, Edward L. Thorndike, the Century Company, New York, 1931, p. 190. By permission.

down over there, would have devised the easiest way. Yet in all the ages men had not improved in this exercise one-half of one per cent., until a scientist using scientific methods spent a few hours studying the matter, and then they suddenly improved four hundred per cent.!

The scientist in question was Dr. Frederick Winslow Taylor, founder of the Taylor Society, who with his co-laborers, Frank B. Gilbreth and Lillian M. Gilbreth, has at last taught the human race better ways of piling stones, laying brick and shoveling sand—the most primitive industrial operations of the human family. They have pointed the way to improved methods of carrying on many other physical operations, but most of all improved methods of cooperating with one another. Doctor Taylor and his associates in this new field of motion-study first took up the problem of handling pig-iron. As he remarks upon the simplicity of the operation:

> "This work is done by men with no other implements than their hands. . . . It is so crude and elementary in its nature that the writer firmly believes that it would be possible to train an intelligent gorilla so as to become a more efficient pig-iron handler than any man can be.
>
> "Yet the science of handling pig-iron is so involved and so intricate that the ordinary workman, who can do only that type of work, can not work out the principles for himself. He must have the aid of a better educated man."*

It goes to show how inefficient we poor mortals are. When the Spanish War opened, the Bethlehem Steel Company had some eighty thousand tons of pig-iron in small piles in an open field which it wished to have moved. This gave Doctor Taylor an opportunity to test the advantages of scientific method in even so simple a task over the old-fashioned way of doing it.

**The Principles of Scientific Management,* Frederick Winslow Taylor, Harper and Brothers, New York, 1915. Quoted by permission.

The test consisted of having each man pick up a pig of iron weighing an average of ninety-two pounds, walk up an inclined plank and drop it on to a freight-car. He found that the men were carrying an average of twelve and one-half long tons (two thousand two hundred and forty pounds each) per day. After observing these men with a stop-watch for a few days and making careful measurements of their false movements and devising better and easier ones, he found that a first-class working man could just as easily handle forty-seven long tons per day instead of twelve and one-half! He was so astonished that he checked his work again lest he had made some miscalculation. It was finally demonstrated that a good workman could readily be trained so that he could load forty-seven to forty-eight tons per day instead of twelve and one-half; and, most astonishing of all, he was no more fatigued at night—indeed scarcely so much fatigued—than he had been when he handled the lesser amounts.

Doctor Taylor also carried out a similar experiment on the "science" (!) of shoveling sand. It seems truly astonishing, Manstreet, that men should never have discovered there is a science of it. We have all smiled over the Irishman who commented on the life and character of a dead friend, "Yes, I would say Pat was a good shoveler, but I never thought Pat was a fancy shoveler." But these studies show there is no joke about it; the fancy shoveling of sand is a science as well as an art. As Doctor Taylor says:

> "Although the reader may be convinced that there is a certain science back of the handling of

> pig iron, still it is more than likely that he is still skeptical as to the existence of a science for doing other kinds of labor. One of the important objects of this paper is to convince its readers that every single act of every workman can be reduced to a science. With the hope of fully convincing the reader of this fact, therefore, the writer proposes to give several more simple illustrations from among the thousands which are at hand.
>
> "For example, the average man would question whether there is much of any science in the work of shoveling. Yet there is but little doubt, if any intelligent reader of this paper were deliberately to set out to find what may be called the foundation of the science of shoveling, that with perhaps 15 to 20 hours of thought and analysis he would be almost sure to have arrived at the essence of this science. On the other hand, so completely are the rule-of-thumb ideas still dominant that the writer has never met a single shovel contractor to whom it had ever even occurred that there was such a thing as the science of shoveling. This science is so elementary as to be almost self-evident.*

Think of it, Manstreet: if any intelligent man in all the centuries had devoted fifteen to twenty hours to using his *mind* on the problem, Doctor Taylor believes he would have hit on the correct principle! If all the shovelers of all the ages had used the correct type and size of shovels it is conceivable that with all their labor they would have shoveled the earth entirely away, and we would now have nothing left to dwell on! Perhaps it was this fear that prevented them from adopting scientific management!

After much experimentation Doctor Taylor discovered that a shovel carrying an average load of twenty-one pounds brings the best results and the least fatigue

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**The Principles of Scientific Management,* Frederick Winslow Taylor, pp. 40, 64-65.

to the average workman. This means that, where a company has men handling different types of material the shovels must be of different sizes, each shovel suited to carry about twenty-one pounds of coal or iron or clay or sand, as the case may be. With this type of shovel the number of tons that can be shoveled per day per average man is easily increased from sixteen tons under the old plan to fifty-nine tons per day under the new plan with *no additional fatigue.* As a rule, in all kinds of work conducted by scientifically plotted movements, the fatigue is considerably reduced, and the cheerfulness and good-will of the workman correspondingly increased.

Doctor Taylor's able colleagues, Dr. Frank B. Gilbreth and his famous wife, Dr. Lillian M. Gilbreth, make the following statement of some of the astounding results obtained from studying the motions of the human body in carrying out simple operations:

> "In laying brick, the motions used in laying a single brick were reduced from eighteen to five—with an increase in output of from one hundred to one hundred and fifty an hour and with a reduction in the resulting fatigue. In folding cotton cloth, twenty to thirty motions were reduced to ten or twelve, with the result that instead of one hundred and fifty dozen pieces of cloth, four hundred dozen were folded, with no added fatigue. The motions of a girl putting paper on boxes of shoe polish were studied. Her methods were changed only slightly, and where she had been doing twenty-four boxes in forty seconds, she did twenty-four in twenty seconds with less effort. Similar studies have cut down the motions not only of men and women in other trades but also of surgeons, of nurses, of office workers; in fact, of workers in every type of work studied."*

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*Quoted by permission from *Applied Motion Study*, by Frank B. Gilbreth and Lillian M. Gilbreth, Sturgis and Walton, New York, 1917.

You would think, Manstreet, that somebody would have tried several million years ago to figure out the simplest and easiest way to cook. Man, or rather woman, has been cooking ever since he (or she) discovered fire, but during all these millions of years no one until recently ever spent a hundred hours in arranging the fire, the cooking utensils, the dishwashing apparatus, salt, pepper, butter, eggs, knives, forks, etc., etc., so they might be got at and used with the least expenditure of effort and time.

Even in modern times when men have invented convenient barns and cow stables and silos and corn cribs and arranged troughs so that hogs can drink their swill without working off their precious fat in any lost motions no man has thought enough of his wife to try to arrange a kitchen so she would not strain her back and cramp her legs and break down her arches and run off her fat and destroy her health, temper and affection.

It remained for a woman, Dr. Lillian M. Gilbreth, to study the kitchen by scientific methods. It never occurred to the affectionate husband, who condemned his wife to spend most of her life in the kitchen, to build it to *fit her size*. But Doctor Gilbreth has come to the rescue of womankind and designed a kitchen which without greater expense can be built and arranged to suit the size, height and avoirdupois of the woman who is going to use it. The *New York Herald Tribune* has taken over this scientific enterprise and is glad to furnish designs and specifications free of charge to any one anywhere in the world.

As instance of the physical, psychological, biological, sociological, intellectual, spiritual and religious values of this kitchen, I may say that it has reduced the number of steps required for making, say, a strawberry shortcake from two hundred and eighty-six to forty-five! The number of kitchen operations and movements have been reduced from ninety-seven to sixty-four. For making biscuits and the like, the steps and movements have been reduced on a scale of from one hundred to fifteen.

Nearly all tables, stoves and sinks are thirty-one inches high. Doctor Gilbreth has shown that for a woman five feet seven inches tall they should be *thirty-six inches high.* To meet the requirements of women of other heights she has designed kitchen surfaces including the stove and tables with adjustable legs, movable shelves and other adjustable conveniences.

I have no desire, Manstreet, to describe all the other features of Doctor Gilbreth's kitchens. You would not be interested to know just where to place the bread knife, or—in these times—the cork-screw, so you could get at it without walking two or three times round the kitchen and then diving your hand down into a drawer filled with can-openers, peeling knives and the like and getting your fingers and temper lacerated. I need only say that a special committee from Germany has recently visited this country, and studied all the different types of efficiency kitchens designed in recent years. They unanimously decided on the *Herald-Tribune* Institute kitchen as the best.

In one of his books Doctor Taylor, who in my judgment is one of the great scientific discoverers, quotes President Roosevelt as saying, "The conservation of our national resources is preliminary to the deeper question of national efficiency." When we put into practise what Doctor Taylor and his associates have discovered for us, to wit, that the simplest operations as well as the most complex may be carried on with from one-half to one-tenth the effort men and women have been using for countless ages, a superlatively great advance will have been accomplished in national efficiency and the application of science to life. In its importance, it is almost comparable to the discovery of fire and the smelting of metals.

Women may, I believe, be counted on to welcome the new efficiency methods that mean so much for their comfort. As for men, that Labor Unions and other organizations should fight such great industrial discoveries is most discouraging. As Doctor Taylor points out, men will purposely continue inexpert methods for fear the work will soon all be done, and they will then be idle. ''Soldiering'' on the job is one of the last supreme evidences of the stupidity of man in his social organization. The worker himself can not be blamed because as an individual he is a helpless cog in a great industrial machine. It has commonly been charged that the great offenders in this matter of soldiering have been the Labor Unions. But a recent volume, of great importance, which represents prolonged research, has shown that unorganized workers soldier just as much, and are as much under the dominance of this false conception of the economics of production, as the Labor Unions themselves.*

The problem of handling this situation is one of the largest problems before the statesmanship of industry, both on the side of labor and on the side of capital. It will be solved. I have at times spoken pessimistically, Manstreet, but down in my heart I believe we are not a race of morons but, comparatively speaking, a race of geniuses. Men can be taught to shovel sand and pile bricks, as well as paint pictures and write poetry, in the most effective way. These seemingly simple processes, which are in reality so complex, will resolve themselves into means of happiness before the advance of science.

**The Restriction of Output among Unorganized Workers,* by Stanley B. Mathewson, The Viking Press, New York, 1931.

In the same way the processes of social cooperation will ultimately be resolved by just a few men devoting a few hours, or a few hundreds of hours, or, possibly, a few hundreds of years, to their solution.

For, if modern life and science have demonstrated anything, it is that a man can not be happy unto himself alone. He can be happy only when he plays an effective part in the social process. And for aiding both the highest and the humblest man to achieve this rôle, the scientific management of industry is one of the most hopeful things that loom ahead in the human firmament. Our mechanical and chemical inventors can give us automobiles, airplanes, radios and the like, but it is only the scientific management of men's minds and impulses that will bring them permanent individual and social happiness. The Taylor Society is one of the most effective organizations in the whole commercial and industrial world pointing the way toward this lasting social effectiveness and peace.

It all goes to show, by another example, what I have maintained is the purpose of this volume. The education of men in the spirit and uses of science holds out the largest hopes for their enduring happiness that can now be envisioned in the great round of the human horizon.

NOTE: Beside the books already mentioned the reader who wishes to pursue this fascinating field still further is recommended to read the following which may be procured from the publishers through any bookstore or through The Taylor Society, 29 West 39th Street, New York, N. Y.: *The Psychology of Management,* Mrs. Lillian Moller Gilbreth, Macmillan, 1921; *Motion Study for the Handicapped,* Frank B. Gilbreth and Lillian M. Gilbreth, E. P. Dutton & Company, New York, 1920; *Shop Management,* Frederick Winslow Taylor, Harper & Brothers, 1911.

CHAPTER XXII

You are wrong if you believe

THAT YOU CAN'T REASON WITH A WOMAN

MORE sheer rot has been written about the differences between men and women than about almost any other subject of human contemplation. Fiction and poetry are simply filled with assertions that do not present the slightest evidence. For instance, we are told that woman is dominated by feeling, man by reason; that woman's knowledge of the world is intuitive; man's logical and scientific. And so, we are assured, it is no use to reason with a woman.

Prof. Floyd H. Allport, of Syracuse University, one of America's ablest psychologists, after summing up all the evidence, can find no shred of scientific support for this conclusion.* I could quote numerous other leading psychologists to the same effect. I have myself searched quantities of literature but have unearthed practically nothing to establish that women are more illogical, unreasonable, or more controlled by emotion than men. Indeed, Manstreet, here is a notion of great importance about which I am sorry to say you are wrong.

**Harper's Magazine*, March, 1929, p. 400.

CHAPTER XXIII

You are wrong if you believe

THAT YOU NATURALLY REMEMBER FACES BETTER THAN NAMES

OF COURSE you do remember the faces of a great many people whose names you can not recall. But this is not because you have any better natural memory for faces than for names. It is due in the first place to the fact that a man *brings his face with him.* There it is spread out before you like an open book, smiling or grouchy, happy or sorrowful, as the case may be! In the second place, the face has far more features to it than either the printed or the spoken name. It has bumps and humps and wrinkles and colors and, in fact, presents a complicated field of topography. In the third place, you have probably looked at the face for from five minutes to many hours. If you looked at the name that long, and had stamped on your brain as many repeated impressions of the name as you have of the face, you would probably, because of its simplicity, remember it better than the face. Also, if a man had his name spread out all over his chest, as he has his face spread out, so to speak, all over his countenance, you would remember it just as well.

If, Manstreet, you wish to remember people's names, the only way to do it is to think about them, to repeat your impressions of them, to hook them up to other things in your mind, because the secret of all memory is thinking.

Chapter XXIV

You are wrong if you believe

THAT TELEPATHY IS A PROVED FACT OF NATURE

It is impossible, without writing a volume even to outline the technical methods and conditions that must be satisfied before the notion or doctrine can be considered proved that minds can communicate with each other at a distance without physical contact of any kind or without the use of the physical instruments designed by man. The claims of people who maintain that telepathy "works," and that they are constantly receiving valid messages from some lover or friend, are beneath scientific consideration. I am extremely skeptical of all the stories we hear of people having received mental messages of the death or injury of a loved one many miles away. If science rested its claim on such flimsy "evidence" as is offered, we would still be in the dark ages. The evidence submitted by Sir Oliver Lodge and Sir Arthur Conan Doyle is profoundly unimpressive as furnishing what would be regarded as proof in any other field of science. All such so-called "evidence" is obviously shot through and through with wishful thinking.

The Society for Psychical Research has made some rather worthy attempts to put this doctrine to the test of experiment, but the tests have been singularly inconclusive. I shall only refer to one of these attempts because of its respectability.*

**Experiments in Psychical Research at Leland Stanford Junior University*, by John Edgar Coover, Fellow in Psychical Research and Assistant Professor of Psychology. Stanford University Press, 1917. Also quoted and described by A. S. E. Ackerman in his *Popular Fallacies, op. cit.* pp. 122 *et seq.*

One of the main features of this research was the effort to read the number and form of a playing card that another person was holding intently in mind. The experimenter first shuffled the pack and then threw a die. If the number on the die that came up was an odd number, the experimenter turned the pack over, looked at the bottom card and for a number of seconds did his utmost to "will" or transfer to the mind of another person cooperating in the experiment the denomination of the card. The cooperator recorded his guess as to what the card was. As a control of this feature of the experiment if the die turned up an even number, the experimenter did not look at the card until *after his associate had recorded his guess.*

It would be difficult to stage a more effective check on the question of thought transference than this. If the associate succeeded far more frequently in guessing the bottom card when the experimenter was thinking intensively about it and doing his best to project the thought into the other person's mind than he did when neither party knew what the card was, it would have been a fairly conclusive inference that probably there were "thought waves," or "telepathic" communication of some kind, between the two minds.

The result of ten thousand experiments of this sort with university students was an absolute fiasco. The guesses were no better when the experimenter was doing his utmost to transfer his thought to the other person than when he himself did not know what the card was and could not have had it in his mind.

The telepathically inclined person will object that probably none of these students was a "psychic." That is another popular notion without the slightest foundation in experimental science, namely, that some people are more "psychic" than others, or more "sensitive" to mental impressions from other living people or from the spirits of the dead. All the evidence to date indicates that one person is just as psychic as another, and that a lamp-post is just as psychic as the most sensitive human being in the world. In this Leland Stanford research a test was made in which ten "psychics" were given the same opportunity to receive messages from the experimenter. Five of them were professional spiritistic mediums and they devoted much time and the most sincere effort to aid in the experiment. Again the result was a fiasco. The psychics did no better in over one thousand experiments than the dumbest and least sensitive students.

This one experiment—and there are numerous others just as negative—does not completely disprove telepathy. As I argued extensively in a previous volume,* it is probable that the theory of telepathy can *never* be absolutely disproved. You can not prove a universal negative. If telepathy does not work in this case, the believer may always say it did work or would work in some other case. But we may say emphatically that the evidence to date in proof of telepathy on the positive side furnishes an absurdly weak and meager ground-work upon which to rear such a monumental and inclusive belief about the nature of thought and the operations of the world in which we live.

All we can say is that the person who believes in telepathy on the flimsy evidence so far accumulated is the kind of person who likes to believe in telepathy, just as we showed was the case with astrology. He is the kind of person who is unfamiliar with the rigidity of scientific methods and unwilling to make the mental effort to apply them. In fact, he usually clings to his belief with religious fervor, and when a man has laid

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**The Marks of an Educated Man,* A. E. Wiggam, The Bobbs-Merrill Company, Indianapolis, 1930.

hold of a belief or a belief has laid hold of him as a religion, there is little use arguing with him on the basis of fact. I long ago found that it makes very little difference what you say to people who believe in telepathy; they still believe in telepathy. But the scientist will await immensely more conclusive evidence than has so far been developed before he comes to any positive conclusions.

CHAPTER XXV

You are wrong if you believe

ONE FAMOUS FOREFATHER IS WORTH HAVING

SINCE I have spent a large portion of my life pleading with the American people to recognize more than they do the value of good ancestry, you may think that I am inconsistent when I say that one famous forefather is scarcely worth having. But it really reenforces my plea. When people speak of being directly descended from William the Conqueror, or John Alden, or Pocahontas, or some other notable person, they assume that some of the virtues of the famous person have descended directly to them, and that they actually have some of the blood of this ancestor coursing in their veins. Many a man, for example, traces his ancestry back to Charlemagne. As Professor Conklin of Princeton points out, this is a distinction that he shares in common with about half the American people! David Starr Jordan and his assistant, Sarah Louise Kimball, have shown that the same is true of the English.

Indeed, this celebrated knight of old was something of a progenitor, since writers credit him with having at least one hundred and fifty children. Professor Conklin remarks, "He was very fond of children, but never knew how many he had!" When Miss Kimball calls the English people "the inbred descendants of Charlemagne," she is probably not far from the truth. Much the same could be said of William the Conqueror and a few of the doughty knights that accompanied him.

But when we figure the actual influence on our heredity of some one person even half a dozen generations back, it fades almost to nothingness, provided there have not been numerous cousin marriages and the like within the family. Since no one has worked this out more thoughtfully than Doctor Jordan and Miss Kimball, I can do no better than quote a few passages from their statements first published in the *Scientific Monthly* and now included in the volume entitled *Your Family Tree.**

Beginning with Isabel de Vermandois, a Norman lady born about 1070 who on her father's side was descended through six separate strains from Charlemagne and on her mother's side from Alfred the Great, the authors trace Miss Kimball's family tree down to herself. They then make a statement that should make you and me, Manstreet, feel socially important: "The virtues and charms of this far-off lady concern us very little; so also the manly qualities of either of the earls (Isabel married two English earls), although all three of these once exalted personages were no doubt ancestors of yours, gentle reader, as well as of both the present writers. It should also be noted that a very large (although indefinable) percentage of British and American families of marked originality and energy are descended from Isabel."[1]

However, when we come to calculate the direct influence of the distinguished Lady Isabel and the actual quantity of her blood that is now likely to be coursing in your veins or mine, we become dizzy headed in try-

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**Your Family Tree,* by David Starr Jordan and Sarah Louise Kimball, Appleton's, New York, 1929. Quoted in this chapter by permission.

[1] In fact, the human race is so much inbred that Dr. Charles B. Davenport of the Carnegie Institute has figured that you are probably a fifteenth cousin and certainly not more than a thirtieth cousin of every person you meet. No doubt the relationship is usually much closer than that if we confine ourselves to those descended from the old American stocks.

ing to grasp its infinitesimal minuteness. If there were no intermarriages of fourth or fifth or tenth or fifteenth cousins it has been calculated that thirty-four generations back each one of us would have 17,000,000,000 ancestors! Most people who trace their ancestry to some one distinguished person usually believe that they are carrying several quarts of this far-off blood, but the following passages will indicate that the actual amount is extremely minute even though there have been, as there always are, thousands of intermarriages. Doctor Jordan and Miss Kimball say:

> "If the ancestry of a single person running back to the twelfth century could be written out, using a square inch to each name, it would occupy about a fourth of a square mile. In this connection it should be noted that as each person had two parents, four grandparents, eight great-grandparents, and so back endlessly in geometrical progression every one of Isabel's adult twentieth-century descendants would, if the facts permitted, count more than thirty million (33,554,432) separate ancestors at the beginning of her era, the twelfth century. Furthermore, as in such a progression the sum of the series is equivalent (minus two) to its highest term, each descendant should have 33,554,432 intervening forbears, making 67,108,862 in all. Again, each child of this generation has twice as many ancestors as either parent—that is 134,217,724 in all, of which incalculable number no one would have died in infancy, or without issue. This, however, has led us to figures manifestly impossible in view of the fact that the total population of England in 1100 did not exceed two millions, and that probably not one-tenth of these, beset as they were by war and pestilence, left permanent lines of descendants.
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> "The simple explanation is, of course, that each

> forbear must be counted over and over thousands or millions of times in each individual case. Indeed, no one can guess how many tangled lines lead down to him from Isabel, or even from Henry I, Edward I, or Robert Bruce.
>
> "Again, if every couple of the twelfth century, and of all succeeding ones left let us say on the average four children, thus doubling their own number with each generation, Isabel's descendants alone, facts permitting, should now number 33,554,432 as would the descendants of every other pair similarly fertile, the whole yielding a nominal total far exceeding the present population of the globe! Thus in this matter also intervening individuals must be reckoned over and over again almost to infinity.
>
> "A boasted 'line of long descent' is therefore only the merest fragment of a man's genealogy, and differs from other lines only in being for a time a shade more conspicuous, or because some one has taken the pains to trace and record it."

The fact is, Manstreet, that a man's ancestry is probably the most important thing about him, but the chief values in his pedigree come not from some one famous person of long ago, but the kind of persons that stretch in between him and this distinguished forbear. The commonest man can soon find both heroes and gallows' birds in his ancestry by going back just a few generations. A man's immediate parents outweigh all the previous ancestors stretching back to Adam.

When young people marry scarcely anything is more important than the good health, sanity, intelligence and moral character of the contracting parties themselves. Their "influence" upon the natural traits of their children is, to say the least, very great. Next in importance is the quality of the parents of the married couple, and then the quality of the grandparents. If three generations are reasonably sound and healthy it is the best prophecy that nature can give of the health, long life and general soundness of the children.

We have paid so little attention to breeding the human family that we have no pure strains. All families are "carriers" of defects, but in some families the chances of defective offspring are many, many times as great as in others. Also in some families the chances of geniuses being born are hundreds, even thousands, of times greater than in other families. But in order to determine these chance probabilities, it is of no scientific value whatever to be descended from Charlemagne, or Alfred the Great, or any person great or small ten or twenty generations ago. We can all trace back to some great person, if we take the trouble, but we shall likely find a lot of scoundrels along the route. Nothing is more important than a true pride of ancestry because blood does tell; but blood or, more exactly, the germ cells from which we are born, is not drawn from remote but from immediate ancestors. In other words, it is far better to have a mother and father of good health and sound common sense than to have the whole French and English nobility and all the Pilgrim forefathers in your ancestry of long ago, because practically everybody, whether genius or fool, can claim this biological distinction.

CHAPTER XXVI

You are wrong if you believe

THAT IMMIGRATION WILL INCREASE A COUNTRY'S POPULATION AND EMIGRATION WILL DECREASE IT

I AM sorry, Manstreet, that you should be so utterly wrong in your notion about immigration and population problems in general. But alas! you have plenty of company! Practically every statesman in the world is wrong about his population problem. Practically every nation is wrong about its population problem. It goes without saying that the average man is wrong and, as usual, does not know he is wrong, or how to find out whether he is right or wrong; and since he knows nothing about it, he has very positive opinions on the subject.

As the situation stands to-day, Manstreet, most of the nations of the world are divided into two classes: those who want more people and those who want fewer people. All the European nations and most of the Asiatic nations want fewer people. Some few countries remain, such as Canada, Australia, New Zealand and parts of Africa and South America that want more people. Fortunately, Canada and Australia have begun to see that the best way to populate a new country is to take the method advocated by the famous Chicago (or was it New York?) alderman for securing a large supply of gondolas for the park lagoon: purchase two, a male and a female, and let nature take its course.

Would to heaven America had taken this policy in 1820! It might have excluded your ancestors, Manstreet, and would certainly have excluded some of mine; but I do not think America would have lost irreparably by this circumstance. In fact, I think America would probably have been an immensely greater and finer country if it had not imported a single immigrant after 1820 or 1830. You will not agree with this, especially if you or your ancestors came over since then, but that has no bearing on the greatest lesson in the population problem the world has ever staged. I mean the lesson of America's immigration policy during the past century.

Let us examine some of the outstanding features of this immense and dramatic national experience. It seems obvious that the one lesson of immortal importance America's immigration policy has taught the whole world is embodied in what is known among students as "Walker's Law." It is an amazing revelation of a wholly unexpected natural phenomenon. Stated in broad terms this law is that, at least under the conditions prevailing throughout the world during the past hundred and fifty years, *when people migrate from one country and settle in another they do not decrease the population of their home country, nor do they increase the population of their newly adopted country.*

On the surface this looks like a plain violation of common arithmetic. If a million people should leave one country and migrate to another it seems only common sense that they have subtracted a million from the first country and added a million to the second. Every statesman in the world to-day whose views I have been able to ascertain holds this conclusion. Certainly Mussolini and the Japanese statesmen do. True some statesmen, such as the more far-sighted leaders of Canada and Australia, are strenuously opposed to the reception within their domains of any but a highly selected few foreign immigrants; but they do not op-pose it on the ground of Walker's Law. No statesman seems to have the remotest inkling that migration from a country does not relieve the home population and that immigration into a country does not add to the number of its people.

Why are they wrong? Because of the extraordinary sensitiveness of the human being as a breeding animal. You have probably heard, Manstreet, of the English preacher, J. R. Malthus, who, some one hundred and twenty-five years ago wrote a three-volume work *An Essay on the Principle of Population.* His fundamental proposition was that a race will increase until its numbers reach the limit of the food supply. Then, in some way, the deaths must balance the births as the race can not increase further. He recognized that births would be checked by such things as deferred marriage, celibacy and voluntary birth restrictions of various types. He recognized also that the death-rate would rise through war, famine, pestilence, etc. From these combined causes he believed population would for ever be pressing on the edge of starvation and, while war, famine and pestilence would occasionally relieve the pressure, the gaps would soon be filled by the expansive power of the birth-rate and the race be again on the verge of misery and starvation.

One of our ablest and most cautious sociologists and students of population is Dr. Henry Pratt Fairchild of New York University. I am deeply indebted to him for material and counsel in the preparation of this chapter. He states in his invaluable book, *Immigration, A World Movement and Its American Significance,* that, though the doctrines of Malthus "are now more than a century old, they still stand as one of the profoundest contributions to human knowledge. . . . The basic principles . . . remain as unassailable as when they were first propounded." We now realize more fully than Malthus did that births are intensely sensitive to what are known as "institutional checks," such as the demands of education, social obligations, the "emancipation" of women and, even more importantly the standard of living. Indeed the fight of every family to maintain the standard of comforts and luxuries which are deemed "necessities" in its particular stratum of society is one of the most vigorous and ceaseless agencies influencing the biological fortunes of mankind. People will even starve and deny the sex instinct to maintain the standard of living demanded by their own section of society. Mrs. Grundy is an exceedingly powerful arbiter of man's biological destiny.

All this bears directly on the strange anomaly in apparent defiance of plain arithmetic set forth in Walker's Law. In a recent address before the American Academy of Political and Social Science, Professor Fairchild stated with singular effectiveness the case for Walker's Law as applied to America:

> "In view of these facts, what is the effect of emigration on a country which is experiencing the pressure of population upon the supporting power of the soil? Obviously, the immediate effect of emigration is to relieve the factor of population by the departure of a certain number of individuals. Yet, that population is under extreme pressure and is trying to force itself to wider limits. If the exodus is a moderate and gradual one, as most of the emigration currents of the past hundred years have been, the effect is simply to relax the tension upon population and to give it an opportunity for the expansion which it has not had. Population surges forward and fills up the gaps left by the emigrants, and, as the emigration stream flows on, the population remains just as

large as it was before, and according to some students, becomes even larger.

"The same principle prevails in the immigrating country. If it is an old country where the balance has been struck between the desire for population and the desire for standard of living, the immigrants intensify the pressure of the population upon the existing economic situation, forcing a reduction in the increase of native population, and resulting in no greater growth in the total population than would have taken place without any immigration.

"I will not take up your time to enter into an elaborate, detailed, theoretical exposition of the foregoing principles. I will simply say that so far as my studies have gone, these principles are accepted by practically every scientific student of the population problem and of the immigration problem, and, so far as this country is concerned, the theory is usually stated by saying that we have in 1930 no larger population in the United States than we would have had if not one immigrant had come to our shores since the year 1820.

"That doctrine is so well supported, so thoroughly documented by all the best scientific literature on the subject, that it stands as one of the most unassailable conclusions of economic and social theory. That being the case, the conclusion naturally follows that under prevailing conditions in Europe, to say nothing of the more overcrowded countries of the Orient, emigration is no relief for overpopulation. It is a false and illusive expedient which rather aggravates the evils that it is sought to remedy.

"Those who have read the report of the Red Cross Commission to China will perhaps recall the very dramatic paragraph in which that Commission sums up its conclusions in this matter with respect to China. The statement is made

> that if all the less crowded lands of the world were to open their doors wide, and if all the passenger ships that sail the seven seas were to be diverted from their ordinary routes and used exclusively to carry Chinese emigrants, the whole fleet could not possibly keep up with the annual increase of population."*

Rather pathetic, Manstreet, for statesmen to build war-ships and develop armies in order to conquer other lands where they can "transport their surplus populations"—pathetic on a colossal scale when we consider abundant proofs that they are plainly flying in the face of nature! Rivers of blood bear witness to another wrong popular notion.

Population pressure and desire for possession of other lands to relieve this pressure by the departure of the surplus population, was perhaps the basic cause of the World War. Certainly it was an important factor, and it was a cause that had been gathering its sinister forces for centuries. Yet when the vast holocaust is all over, we find three outstanding facts that it seems the statesmen of the world would never forget. First, the *actual murder of at least twelve million people did not decrease the population for more than a few years* —a trivial moment in the march of history. Second, if any nation had actually triumphed and could have shipped its population into the conquered territories by the millions, the inexorable forces within man's being would soon have filled up the home land. Third, and strangest of all, these emigrants would not have increased, but would probably have *actually decreased, the population of the countries to which they traveled.*

For it seems to be a law of nature as relentless as gravitation that scarcely are the ears of those killed in

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*Printed by permission from *The Annals* of the American Academy of Political and Social Science Vol. 150, July, 1930.

war stopped up by death before the cry of a new and larger generation of children is heard throughout the land. It seems to be an equally inescapable law that when people migrate, the cradles at home rush to make up the losses, almost before the ships carrying the emigrants are out of port. And when the emigrants reach the land of their adoption, they set up in the native stocks a repugnance against them, so that the natives cease bringing children into the world to compete with their standard of living, which is almost always lower.

These laws of nature are spread out on a colossal scale in the history of America. Following the great Irish famine in 1840 and the European revolutions of the following decade, this country opened its doors to immigrants on the theory that we were a heaven sent "asylum for the oppressed." We overlooked the fact that as a rule people who allow themselves to be oppressed in their home lands will probably permit themselves to be oppressed in their new abode, though the tryants may be changed for industrial and political bosses. During the Civil War the tide of immigration temporarily subsided, but as soon as the war was over we added to the asylum theory the even more destructive theory of our capitalists and politicians that we must have cheap labor to build our railroads and work in our factories, and immigrants to settle our western lands and develop our natural resources.

Had all these newcomers been of the same stock as the native population, the disaster, from a political and social standpoint, would have been in some degree mitigated. We would have had at least a homogeneous population with similar historic backgrounds and common social and political ideals. But the advertising agents of our big industries and steamship companies scoured the slums of European cities and peasant populations of the villages and farms of southern and eastern Europe and western Asia. Thence they gathered immigrants by the millions with old historic hatreds of one another, with racial and national differences that have created half the political, economic and educational problems from which we suffer to-day.

We commonly think that the Fathers of our country originated this ghastly historic blunder. Another wrong popular notion! Almost to a man those far-seeing statesmen warned us against a free immigration policy. They pointed out that we were simply selling our national birthright for a mess of pottage. Mr. Guy Irving Burch, Executive Secretary of the Population Reference Bureau, has furnished me with numerous quotations from the writings of Washington, Jefferson, Franklin, Madison and other statesmen, proving conclusively that our whole immigration policy has been an utter departure from the wisdom of the Fathers. Let us consider a few of these statements:

George Washington said:

> "I do most devoutly wish that we had not a single foreigner amongst us except Marquis de Lafayette." He instructed the recruiting service "not to enlist any person who is not an American born," and ordered, "No man shall be appointed as a sentry who is not a native of this country."

John Adams said:

> "I have no intention to invite immigrants, even if there are no restrictive acts against it. I am opposed to it altogether."

Thomas Jefferson said:

> "They will bring with them the principles of the governments they leave, or if able to throw them off, it will be in exchange for an unbounded licen-

> tiousness, passing, as usual, from one extreme to the other. It would be a miracle were they to stop precisely at the point of temperate liberty. These principles, with their language, they will transmit to their children. In proportion to their numbers, they will share legislation with us. They will infuse into it their spirit, warp or bias its direction, and render it a heterogeneous, incoherent, distracted mass."

Benjamin Franklin said:

> "The importation of foreigners into a country that has as many inhabitants as the present employments and provisions for subsistence will bear, will be in the end no increase of people, unless the newcomers have more industry and frugality than the natives, and then they will provide more subsistence, and increase in the country; but they will gradually eat the natives out. Nor is it necessary to bring in foreigners to fill up any occasional vacancy in a country, for such vacancy (if the laws are good) will soon be filled by natural generation."

Alexander Hamilton said:

> "The influx of foreigners must, therefore, tend to produce a heterogeneous compound; to change and corrupt the national spirit; to complicate and confound public opinion; to introduce foreign propensities. In the composition of society, the harmony of the ingredients is all-important, and whatever tends to a discordant inter-mixture must have an injurious tendency."

The words of Jefferson and Hamilton seem to prefigure Tammany Hall to-day and bring to mind forcibly the political situation in Chicago, St. Louis and every large city of our nation at this very hour. One may smile at the spectacle of Arthur Brisbane, our most influential editor, pleading with us to heed the inspired warnings of George Washington against "entangling foreign alliances" (such as the League of Nations) and in the next breath advocating a free immigration policy, which Washington also opposed. There are many senators and representatives who put themselves in the same ridiculous position as Mr. Brisbane.

If you doubt, Manstreet, that Walker's Law is, as Professor Fairchild says, "thoroughly documented by all the best scientific literature," let us look at some of it. The following systematic outline of our immigration history has in the main been worked out by Mr. Robert Nathanson, a student in Professor Dittmer's sociology classes in New York University, and has been lent to me by Mr. Burch from his Population Reference Bureau. It presents the main features of Walker's theory. The figures and statements, partly quoted and partly paraphrased, are taken chiefly from General Walker's own volume, *Restriction of Immigration.**

I. "Foreign immigration into this country," says General Walker, "has, from the time it first assumed large proportions, amounted, not to a reenforcement of our population, but to a replacement of native by foreign stock." This is indicated by the following facts from our national history:
    a. From 1790-1830, there was a tremendous increase in the population of the United States although immigration was very slight.
    b. From 1790-1800, the population increased 35.1% although few immigrants entered the United States.

**Restriction of Immigration*, by Francis Amasa Walker; Publications of the Immigrant Restriction League No. 33, Henry Holt & Company, 1891. By permission.

- c. From 1800-1810, the population increased 36.38% although there were only 70,000 immigrants who had entered the United States.
- d. From 1810-1820, the population inceased 33.07% and there were only 144,000 immigrants.
- e. From 1820-1830, the population grew to the great total of 12,866,020 with only 151,000 immigrants entering during that decade.
- f. Thus for 40 years, almost entirely out of our native stock the population increased 9,000,000 or 227%, the greatest increase ever seen in any population of an extensive size.
- g. From 1830-1850, although immigration increased greatly, the population did not show an increase over the proportion established before the foreign flood.
- h. From 1830-1840, there were 599,000 immigrants, and yet the population of 1840 was about what, by computation, it would have been with no increase in the number of immigrants.
- i. From 1840-1850, there were 1,713,000 immigrants, and this increase again did not constitute a net gain to the population of the United States.

II. "The fact that as the foreign population came in greater numbers, the native population more and more withheld their increase may be accounted for in three ways." Here Walker says:

- a. "It might be said that it was a mere coincidence."
- b. "It might be said that the foreigners came because the native population was failing to keep up its rate of increase."

c. "It might be said that the growth of the native population was checked by the incoming of the foreign elements in such large numbers."

III. The third explanation seems the correct one because, in Walker's words:

a. "Surely if the correspondence between the increase of the foreign element and the relative decline of the native element is a mere coincidence, it is one of the most astonishing in human history."

b. "The second explanation appears to be false because

(1) The foreigners could not exactly know of the native decrease;

(2) The transportation cost was too high.

c. "Predictions of the probable population of the country in 1840 and 1850 made by an authoritative statistician Elkanah Watson and based on the census reports of 1790, 1800 and 1810, while immigration was at its minimum, correlate remarkably with the actual census returns of 1840 and 1850.

d. "The flood of immigration shocked the principle of population among the native elements: that principle is very sensitive to sentimental and economic conditions."

e. "It is to be noticed that not only did the decline in the native element, as a whole, take place in singular correspondence with the excess of foreign arrival, but *it occurred chiefly in just those regions to which the newcomers most freely resorted.*"

IV. "The more rapidly foreigners came into the United States, the smaller the rate of increase, not merely among the native population separately, but throughout the population of the country as a whole, including the foreigners.'' This is indicated by the following facts:

a. ''By 1860, the population fell below the estimated rate of increase of preceding decades by 310.503.

b. ''From 1880-1890, 5,250,000 foreigners entered the United States, and yet population increased more slowly than during any other period of our history except possibly that of the great Civil War.''

V. ''The ability of the American stock to fill the places of the foreigners, if the foreigners had not come, would be absurd to question in the face of a record such as that of a period from 1790 to 1830.''

Repeating General Walker's theory, ''If the foregoing views are true, foreign immigration into this country has, from the time it first assumed large proportions, amounted, not to a reenforcement of our population, but to a replacement of native by foreign stock. . . . Space would not serve for a full statistical demonstration of the proposition that immigration during the period from 1830 to 1860, instead of constituting a net reenforcement to the population, simply resulted in a replacement of native by foreign elements; but I believe it would be practicable to prove this to the satisfaction of every fair-minded man. . . . It constitutes a statistical demonstration such as is rarely attained in regard to the operations of any social or economic force.''

The following are statements made by competent students of our immigration history:

1. Earle Ashley Walcott, a well-known statistician, says: ''The census returns prove that

immigration in the past century did not increase population, but merely replaced one race stock by another.''

2. Prescott F. Hall, a distinguished sociologist, says: ''Nearly all students of the matter are agreed that the United States would have a larger population to-day if there had been no immigration since 1820.''
3. F. A. Bushee, a thorough student of population, says in an article on the cause of the declining birth-rate: ''It is true that the multiplication of foreign peoples has seriously checked the growth of the old American stock.''
4. Charles A. Elwood, well-known sociologist, says the facts suggest ''that the immigrants have simply displaced an equal number of native born who would have been furnished by the birth-rate if the immigrants had never come. . . . At any rate,'' Elwood continues, ''the population of the country was increasing just as rapidly before the large volume of immigration was received as it increased at any later time. . . . Again, the Southern states, which have received practically no immigrants since the Civil War, have increased their population as rapidly as the Northern states, that is, the increase of population among the Southern whites has been equal to that of the Northern assisted by immigration.''
5. J. M. Gillette made diligent and unbiased statistical studies and found:

> ''The presence of foreign born is one of the several factors that check the increase among the native whites. . . .
>
> ''The rate of increase of native whites is in inverse proportion to the percentage of foreigners in the population. . . .

"Factors which influence the birth-rate in order of importance are:

(1) Urbanism
(2) Income
(3) Immigration
(4) Industrialism
(5) Education
(6) Presence of the negro."

6. Robert Hunter says: "The immigrants are not additional inhabitants. Their coming displaces the native stock."
7. S. G. Fisher says: "Immigration has not materially increased but, on the contrary, has somewhat decreased the American population. . . . All the immigrants and all their increase can not make up for the loss of the old rate of increase of the natives."
8. Rev. Walter A. Rauschenbusch says: "The natives, who suffer by the competition of the immigrants and who feel the tightening grip of our industrial development, refuse to bring children into a world which threatens them with poverty."*

Surely, if any social theory is "well supported and thoroughly documented," it is this theory of immigration. However, before leaving the subject I must cite one other extremely competent student of population, Prof. Edward M. East, of Harvard. In his able and

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*The last three quotations and citations are taken by permission from *Immigration, A World Movement and Its American Significance,* by Henry Pratt Fairchild, Professor of Sociology in New York University; Revised Edition, the Macmillan Company, 1925; the original sources being the following:

6. Hunter, Robert, "Immigration, the Annihilator of Our Native Stock," *The Commons,* April, 1904.
7. Fisher, S. G., *Popular Science Monthly,* Dec., 1895.
8. Rauschenbusch, Walter A., *Christianity and the Social Crisis,* p. 273.

Professor Fairchild also cites various reports of welfare organizations, Mrs. John Van Vorst's book, *The Cry of the Children,* and other writers.

fascinating book, Professor East makes the following statements based on an exhaustive study:

1. "Emigration, forced as an economic necessity by population density, affords no permanent relief to the homeland because the ensuing birth release re-establishes the old equilibrium."

2. "Immigrant competition tends to sterilize the native population."*

It is only fair to say that one excellent student, Prof. E. A. Goldenweiser of New York City, is not in agreement with Walker's theory. He points out that other factors would have reduced our birth-rate if we had had no immigration. All students admit this, because as a nation's population expands and the standard of living rises and people move in large numbers from the country to the city, they always reduce their birth-rate. A lesson statesmen must learn, and have not learned, is that *it is a physical impossibility to maintain large families and a high standard of living.* This is an enormously complex matter, and has its modifications, but on the whole it is axiomatic. Professor Goldenweiser fails completely, however, to account for the fact, already pointed out, that the Southern States have received no immigrants since the Civil War, and yet have increased as rapidly in population as the Northern States *assisted by immigration.* He fails also to account for the fact that just where the immigrants have settled most thickly in the Northern States, there the birth-rate of the native stock has made the greatest and most precipitous decline. General Walker and other students trace this decline throughout the New England States not only into the counties, but into the townships, and even into the city blocks, and find the rule universal that as foreign stocks were introduced the birth-rate of the native stocks went down.

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* East, Edward M., *Heredity and Human Affairs,* Scribner's, 1927, pp. 273, 289.

Now, by dear Manstreet, I am not arguing here that one race of people is "superior" to another race. That is something we know little or nothing about. As I have emphatically stated in my previous books, we have no way of knowing to-day whether any one race is superior or inferior to other races. I am endeavoring to point out for one thing, the utterly destructive fallacy that emigration of so-called "surplus populations" is a remedy for population pressure. As long as this notion is maintained as a part of the world's population policies, it can bring only misery and war in its train. The facts presented create also a profound impression that the migration of millions of people from Europe to America during the past hundred years has probably been of no human benefit whatsoever, when viewed in the light of the "long realities" of history. They leave a grave doubt that American immigration has added anything to the sum total of human happiness or achievement.

Of course, frequent and strenuous efforts are made to point out men and women of conspicuous service and attainment in America, who have been contributed to our national life by the immigrants of the past seventy-five or one hundred years. No one doubts the splendid achievements of these worthy persons. But is there reason to suppose that the descendants of the native stocks normally increasing would not have made up the full number of leaders in art, science and government? And is it not also reasonable to suppose that many of these immigrants would have made distinguished achievements in their home lands?

But the prime thing is that vast migrations have not cured the well-nigh world-wide disease of overpopulation, and have probably aggravated it. This seems particularly true of the nations from which the migrants to America have come in the past century. The fatherlands are as overcrowded as ever, and America has become a babel of tongues, cultures and biological constitutions. After a nation gets well set up in business, as America was by 1820, the majority of immigrants are of a distinctly lower culture and economic status than the earlier stocks. This might not have been so serious in our case had it not been for the fact that the later settlers represented many diverse racial and national cultures, historical backgrounds, religious, social and political ideals. I do not mean that they were unworthy persons, but they were *different* persons. As Prof. E. A. Ross, the eminent sociologist, has said in substance, the English, Irish or North European working man, who had come here and improved his economic status and standard of living, did not propose to bring children into the world to compete with a man who was content to live in a shack with a wife and a large brood, sleep on the floor and eat macaroni off a board. The native birth-rate went down like a shot wherever the new comers settled, while the birth-rate in the fatherland expanded and more than filled the homes that had been left behind.

The sum and substance of it all, Manstreet, is that the *problem of population is the overshadowing problem of the modern world;* and one of its largest phases is this question of emigration to relieve over-crowded areas and immigration to fill up the less densely settled regions of the earth. It simply won't work. If carried out on any large scale it only aggravates the miseries that it seeks to relieve. Nations thus go to war and slaughter human beings by the millions largely because of a wrong popular notion. Until this popular notion is exploded in the minds of industrial leaders, politicians, statesmen and the man in the street, it will go on as a potent cause of war.

For do you know, Manstreet, that something like fifteen million more babies are born every year than there are people who die? The population of two whole nations the size of Belgium are added every twelve months to the mouths that have to be fed from the soil of this now very tiny globe. This means the globe is growing just that much smaller every year in proportion to the people it must feed. It took a thousand centuries prior to the year 1800 for the human race to overcome famine and war and pestilence sufficiently to expand to a population of eight hundred and fifty million. But owing to the discovery of new lands, new chemicals and the invention of machines, within the brief flash of the following century this population expanded to more than one and three-quarter billions! According to Professor East, within little more than another century the whole world will be full; there will be no new lands to fill with surplus populations—every mouth that this old earth can possibly feed will be here hungry to be fed. The earth can feed no more denizens unless manna fall from heaven. Then what? This gigantic situation does lie just beyond tomorrow's horizon. Babies are already born whose grand-children may live to see that day arrive.

If then population pressure is one of the most potent and enduring causes of war, if war itself is no cure for it, if emigration is no cure, what then? Shall we move relentlessly on, as Malthus believed we must, beyond the control of human will, to the point where hunger and disease will for ever reap their ghastly human harvest? There can be but one answer to this question—this "irrepressible issue." That answer is contained in what is probably the greatest triumph of human will and intelligence that the race has yet won in its efforts to control its own destiny. That triumph does not have about it the glamour of war, nor the romance of emigrants seeking new homes in new lands. It is the simple remedy of voluntary, scientific birth-control. Prof. Warren Thompson, of the University of Michigan, in his new book, *Danger Spots in World Population,* compares birth-control in its probable influence on social evolution with the discovery of fire and the invention of printing. I can not but think its influence on man's biological future may be even greater than these. For, if the human race is ever to become better in its inborn bodily health, its inborn intelligence and its inborn moral character, I think undoubtedly the greatest single agency will be man's newly acquired capacity to control the reproduction of his own species.

The alluring hope of race improvement through birth-control lies in this: such students as Frederick Adams Woods, Ellsworth Huntington, Leon Whitney and John Phillips have already developed abundant evidence to give us a secure conviction that voluntary birth-control leads the able, unselfish, long-lived, intelligent, moral and socially-minded members of the community to produce the larger families, while those less energetic and less endowed with gifts of nature reduce the number of their offspring. If this be true, then birth-control is the most powerful moral agent of which the human race has ever become possessed. It will surpass in potency all the preachments of philosophers and theologians and all the efforts of the inspired writers and educators. No money to-day could be devoted to a grander research than one to establish the truth or falsity of this preliminary evidence. The aim of science, Manstreet, is the control of life. And if man can control the reproduction of his own species, and fit their numbers in each nation to the demands of a high standard of existence, a wide use of liberty and a lofty culture, it will be the surest possible guarantee of a world of peace, of happiness, and of material and spiritual progress.

CHAPTER XXVII

You are wrong if you believe

THAT MOST GREAT MEN WERE BORN OF POOR BUT HONEST PARENTS

NOTHING is dearer to the heart of the true democrat than the notion that superior men usually came from lowly origins. But it largely depends on his own temperament whether he ascribes the rise of an individual to "favorable environment" or to "innate determination and energy." If he ascribes it to the latter cause, nine times out of ten he thinks he is ascribing it to environment, although in reality he is ascribing it to heredity, since no one except special students realizes that the problem of heredity and environment is more complex and harder to understand than the theory of relativity. The average man strives to understand relativity because it has such a noble and resounding title and large powers of mind are attributed to the person who can get away with the pretense of understanding it. He does not strive with the same lack of bias to understand the problem of heredity because this involves his personal emotions and his own desire to be important. And as I have said time and again, one of the chief obstructions to the search for truth is one's desire to be important.

You, Manstreet, and your neighbors, almost without exception, hold very positive opinions as to whether human character and conduct are due to environment or to heredity, to opportunity or to inborn passions and capacities. Everywhere I go I hear the most dogmatic statements, although the speaker is usually even more ignorant of the realities of the problem than when he pretends to an opinion about relativity. In fact, Manstreet, as an old working man friend of mine used to say, "The more ignorant a man is, the more positive he is in his opinions." And I might add, the louder he talks about them! Perhaps that is why we always have so much loud talk in a political campaign.

After I had lectured recently on the general facts of heredity, a woman said to me, with great emphasis, "I don't believe in your theories of heredity; I believe a boy can make out of himself anything he makes up his mind to become." I replied, "That is precisely what I have been trying for an hour to prove. I think a man can do a great deal to develop himself into the kind of person he would like to be, but I have been trying to show that a man's determination, persistence, energy and desire to become worth-while are themselves largely matters of heredity. Some people have these traits and some do not; and while we like to think we can instil these passions and this energy into every child, we can at least say it is many times harder to achieve the result with some children than with others. It is this that makes it so terribly hard to understand why some few great men do rise from the ranks, while their comrades all about them, even their own brothers and sisters, fail."

But whatever the cause, the average man loves to believe that most of our great men rose from the ranks. It pleases his self-complacency and increases his confidence that he, too, might have done so had he tried.

As in all cases, the refutation of popular notions consists in simply counting noses. In fact, Manstreet, that is about all that science amounts to—just the habit of counting noses and finding out how many there are of this kind or that. It is only by first finding out how many noses there are, and then finding out how many are big and how many are little, how many are crooked and how many are straight, that we learn anything of any value about noses. Science is, in the main simply counting, that is, the reduction of natural phenomena to number. For example, it was only when Gregor Mendel thought to *count* how many of his garden peas were tall and how many were short, how many had green seeds and how many had yellow, etc., that he discovered the first of the laws of heredity. This simple mental operation, which is merely a habit that any one can cultivate set scientists to work all over the world, and the end result may be a decisive modification of the life, the ethics and the social and biological destiny of mankind.

So let us count a few of the noses of great men and women and see how many came from poor but honest parents in proportion to the number of such parents, and how many came from parents who had sense enough to make and save a little money.

Perhaps we should look first at the list of great men and women in the one country that of all others in history has struggled the hardest over the longest period of time to give every man a chance. I believe you will agree that this country is Great Britain. Great Britain also has the most complete records of the lives of its distinguished citizens of any country in human history. The English *Dictionary of National Biography* contains the biographies of thirty thousand of the most eminent persons of English, Scotch, Welsh and Irish blood during the past fifteen centuries and runs into sixty-seven volumes, with three volumes of supplement. *The Dictionary of American Biography,* of which several volumes have been published, will do as much or more for this country.

It happens that recently this entire library has been examined by Frederick Adams Woods, the biologist, in conjunction with Alleyne Ireland, author of the compendious volume entitled *British Government in The*

Tropics. The investigators found that the artisans, craftsmen, skilled and unskilled laboring classes have furnished approximately twelve per cent. of these distinguished persons, while the "upper classes"—a term which is used here for mere convenience and which includes the landed aristocracy and the professional and government classes—supplied the remaining eighty-eight per cent. The upper classes probably did not constitute more than ten or fifteen per cent. of the total population. So we see the son of a man who has achieved worldly success has many times the chances of himself achieving worldly success as the son of a commoner.

The investigators upset another popular notion, namely, that education and opportunity will steadily increase the proportion of distinguished persons who rise from obscurity to fame. Quite the contrary has been true, at least in English history. Havelock Ellis first suggested the correct view, and it was confirmed by Woods and Ireland. They showed that, whereas, prior to 1800, approximately twelve per cent. of England's illustrious citizens rose from the lower orders of society, the proportion has been steadily decreasing for the past century and a quarter, until now scarcely more than four per cent. of England's great men rise to fame from obscure families. In other words, Manstreet, contrary to all your suppositions, democratic opportunity in the long run defeats itself, and unless measures can be devised to check this tendency, which has probably obtained in all nations committed to the "reign of the common people," it seems likely that national life is bound periodically to decline through the biological disaster brought about by its own economic and political success.

I may add that I am definitely committed to the belief that such measures can be devised and that civilizations can be maintained upon a high level of culture, comfort and the wide distribution of happiness without this progressive loss of leadership. But I am also certain that it is the most delicate, complex and arduous enterprise on which the intelligence and social passions of men have ever embarked. Perhaps, the much misunderstood word "eugenics" best describes this immense human dream. But whether we use the word democracy, aristocracy, socialism, communism, aristo-republicanism, eugenics or what, certainly the universal distribution of opportunity and happiness is the only task worthy of the intelligence and character of a being who has evolved sufficiently to look back on his own history, who can perceive the forces that have guided it, and who can so organize his social life that it may take still greater advantage of the agencies of nature which have wrought his own improvement, in order to guarantee a more majestic future.

Further evidence bearing on the question of the origins of leaders is supplied by Prof. Albert Odin who made a study of the economic status of the parents of all the celebrated French men of letters throughout the past five centuries. The term "men of letters" in France has included, at least in the past, a great many statesmen, scientists and even business and military leaders. He found the poverty theory of genius completely set at naught. His study showed that only nine out of every one hundred of these eminent Frenchmen were born in homes where poverty and honesty were the striking features, while ninety-one out of every one hundred were born from parents who were either rich or well-to-do. The significance of these figures is not evident until we consider that, according to Professor Odin's standards of poverty and wealth, the poor of France throughout this period constituted ninety-seven per cent. of the population, while those in economic comfort, such as lawyers, doctors, engineers, public officers, business men and the ruling classes, composed only three per cent. We see, therefore that this three per cent. produced ten times as much genius as the uncounted millions of the ninety-seven per cent.! A little calculation, therefore, shows that through five hundred years of French history the son of a man who had sufficient energy and ability to rise out of poverty to a station of economic well-being, had three hundred times as many chances of literary fame as the boy born from poor but honest parents.

So I fear, my dear Manstreet, that another one of your most cherished mental souvenirs, with an enormous influence on men's minds and their social and economic plans and hopes, must be quietly and decorously transferred to the boneyard.

CHAPTER XXVIII

You are wrong if you believe

THAT BRILLIANT PEOPLE BREAK DOWN NERVOUSLY OFTENER THAN AVERAGE OR STUPID PEOPLE

THE literature of stupidity, my dear Manstreet, is vastly greater than the literature of knowledge. Both you and I have perhaps made significant additions to the former, and very few to the latter. Indeed, the entire literature of secure knowledge is comparatively meager, and frightfully hard to identify. But in the literature of stupidity scarcely a single item has had a larger place than the notion that the brilliant and able people of the world are more frequently unstable both mentally and physically, and break down oftener under the tensions and pressures of life. You find this notion in fiction, poetry and drama, and in much of the so-called literature of fact. It is a practically universal belief in our common life.

For these reasons we are bound to feel considerable assurance that the truth lies in the opposite direction. True, there is not a large body of experimental evidence on the subject, but this very fact brings out another characteristic that is well-nigh universally true of popular notions: it requires only a slight amount of experimental evidence to show they are not true, even if these experiments do not reveal all the truth of the real situation. A single experiment under controlled conditions may reveal that the popular guesses and the beliefs of centuries, or even the preliminary guesses of the investigator himself, are not true, although it may not reveal all the truth for which he is seeking.

No psychologist of repute believes that anything like all the causes and facts underlying either the balanced or unbalanced functioning of the mental or nervous life are understood. Yet, all we need to put in the discard the notion that the more brilliant the individual is mentally, the more likely his mental functions are to be thrown out of gear, is simply one well-attested series of experiments or objective observations that have been submitted to valid statistical treatment.

Prof. H. L. Hollingworth, former President of the American Psychological Association and Professor of Psychology in Barnard College, Columbia University, has given us just the investigation required to bring out the fallacy of this popular notion. I feel strongly that Professor Hollingworth states one of the most significant truths of modern life when he says:

> "The *practical personal* value of a knowledge of abnormal psychology in dealing with the people one meets every day can scarcely be exaggerated. Severe abnormalities are but the extremes or disturbances of normal tendencies. . . . Few individuals entirely escape contact with pathological impulses, acts, or individuals. Teachers, magistrates, physicians, as well as clerks, bus drivers, and policemen must often either manage or endure them. There are few families that do not contain eccentric, neurotic, dull, perverse, unstable, or psychotic members or relatives, and few individuals that do not have abnormal moments or experiences. Almost every school system labors under the misunderstanding of either feebleminded pupils, hysteric teachers, paranoid superintendents, senile board members, or neurotic and psychopathic patrons. . . .
>
> "The one single thing that can be done about abnormality is to *understand* it. Even when ab-

> normality cannot be modified, to understand it usually solves half of its problems."*

It would be easy to enlarge upon these suggestions, but it is obvious that to get along happily with our fellowmen we must first understand them. An enormous part of the inhumanity of man to man throughout the ages has been due to just this lack of understanding of abnormal behavior. Through such misunderstanding the treatment of persons who committed crime, the social and political processes for the apprehension of criminals, the determination of their guilt, and the efforts to fix their relative responsibility have been ghastly records of stupidity; and little better can be said of these social processes to-day. Just as stupid and as ghastly has been our treatment of the insane and feeble-minded until recently. Professor Hollingworth has, therefore, made a real contribution to the processes for achieving human happiness by furnishing experimental evidence against the common supposition that the more brains you have the more likely you are to exhibit abnormal behavior.

To test the relationship that may exist between intelligence and the functional neuroses, such, for example, as hysteria, neurasthenia and psychasthenia, Professor Hollingworth made a detailed study of several hundred soldiers who had exhibited persistent

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*The quotations in this chapter are by the very generous permission of both the author and publishers, and are taken from *Abnormal Psychology, Its Concepts and Theories,* by H. L. Hollingworth, Ph.D., the Ronald Press Company, New York, 1930. I must express my deep indebtedness to this work. I have studied earnestly for years the numerous extremely suggestive researches on the psychology of nervous disorders, as Professor Hollingworth has, from time to time, issued them from his laboratory. I hope that the educated public and college students especially may be led to a careful perusal of this fine and suggestive contribution to that most essential field of knowledge, the knowledge of our own nature and that of our fellow men.

neurotic symptoms. Such symptoms are usually referred to as "nervous breakdown" or "nervous prostration" or as "going nervously to pieces" and the like. During the war the term "shell-shock" also came into popular use. The words "neurasthenia" and "hysteria" are also employed in popular parlance, with little idea, as we shall see later, of their precise medical meaning. The research was made in the special hospital at Plattsburg Barracks, New York.

The patients were classified on the basis of their diagnosis by the psychiatrists under a large number of technical descriptions. However, I wish here merely to list those classified as representing "functional" conditions, omitting other types of disorders such as feeble-mindedness, epilepsy, cerebro-spinal meningitis, etc. The following table reveals the astonishing and consistent association of gross functional disturbance with low intelligence.

INTELLIGENCE QUOTIENTS OF NEUROTICS

	Intelligence Quotient	Number of Cases
Hysteria	.82	177
Constitutional psychopathy	.82	48
Psychoneurosis (unspecified)	.86	144
Concussion (shell shock)	.87	41
Neurasthenia	.92	83
Psychasthenia	1.00	10

This table makes it clear first, that there is a steady rise in the average intelligence of each separate group from those designated as exhibiting hysteria to those manifesting psychasthenia. The hysteria group, you will note, has a mental rating of 82, and the psychasthenic group 100. (For convenience we disregard the decimal points.) But the second outstanding feature is that they *all fall in the inferior section of the population.* This is because the average intelligence of the general population is 100. Only the psychasthenic group reaches this standard of intelligence. If we should average all the above classes in one grouping, they would rank in the lowest one-fourth of the general population. Indeed the hysterics and constitutional psychopathics would rank in the lowest twenty per cent. of the population in intelligence. As Hollingworth says, “Whatever else the ‘constitution’ of these patients includes it is clear that intelligence defect is one of the striking components of the picture.”

It may be objected that the low intelligence scores of these patients are a result of their disabled condition, and is not a part of their constitutional make-up. Besides strong arguments that Hollingworth presents against this suggestion, the objection largely disappears if we turn to the record of the educational achievement these neurotic men had made during their childhood. Numerous studies have shown that, in our day, there is a very close association between a man's intelligence and the degree of his education. There will be exceptions in any group, but on the general average a man of brains tries to secure considerable schooling. The record of the median grades in school which these neurotic men had achieved is clearly illustrated in the following table:

THE EDUCATION OF NEUROTIC SOLDIERS

Diagnosis	Median Education	Per Cent. With No Schooling	Average Mental Age	Number of Cases
Hysteria	5th grade	23%	11.9	94
Constitutional (psychopathy) .	7th “	13	12.5	39
Psychoneurosis (unspecified) .	7th “	11	13.0	86
Neurasthenia	8th “	5	13.0	57
Psychasthenia	9th “	0	14.9	8

We see at a glance the same picture repeated that was brought out in the first table. "There is a perfect correspondence," as Hollingworth observes, "between the three columns showing the point reached in school, the number with no education, and the mental age [of each group]. . . . It is fairly clear that this educational poverty, in men gathered from all parts of the country, and still for the most part in their third decade of life, is not to be explained away by lack of opportunity. . . . The suggestion that they had never gone to school because they were unable [from lack of opportunity] is clearly ruled out."

All this comes out more clearly if we review the outward symptoms that the bystander could observe among these "nervous" men, and classify them on this basis.

You can easily discern these symptoms yourself in nervous persons. Hollingworth divided the cases into three groups, the first of which, according to the diagnosis of the psychiatrists, exhibited mostly bodily symptoms, the third mostly mental symptoms, while the second was intermediate. The following are some of the symptoms of his three groups:

I. Tremors, stuttering, dizziness, paralyses, contractors, blindness, deafness, weakness, heart trouble, convulsions.
II. Headaches, pains, insomnia, sleep-walking, queer feelings, chills, restlessness, fatigue, fainting-spells.
III. Fears, worries, anxieties, obsessions, ruminations, hypochrondria, depressions, fixed ideas, emotional disturbances.

The astonishing results are exhibited in the following table:

MEDIAN MENTAL AGES OF SYMPTOM GROUPS

		Median Mental Age	Average I. Q.
I.	Physical, overt, bodily symptoms (hysteria?)	10.9	.78
II.	Intermediate, transition symptoms (neurasthenia?)	12.0	.86
III.	Subjective, psychic symptoms (psychasthenia?)	14.5	1.04

It is obvious that if you divide the cases in this manner on the basis of their symptoms there is again a marked difference in intelligence among the groups. Those exhibiting mostly bodily symptoms have a mental age just below eleven years—very close to feeble-mindedness. The intermediate, partly mental and partly physical, classed as the neurasthenics, have a mental age of twelve. And the psychathenics, exhibiting mostly mental disturbances, have a mental age of fourteen and a half years. But a still more significant fact is that the average intelligence of all the cases of nervous breakdown is well below the average intelligence of the general population. It seems we scarcely need more proof, my dear Manstreet, that nervous breakdown is much more common among average and stupid people than among those of high intelligence, the able and brilliant. And in a moment we shall see why this is almost a necessity from the very nature of our mental life.

To sum up Professor Hollingworth's results, there is apparently a pretty regular gradation in intelligence, as manifested both by mental tests and school achievements, among the three classes of neurotics. Lowest of all is the hysteria group with an IQ of 82, a mental age of 11.9 years, and a median education of the fifth school grade, while 23 per cent. had no schooling. The neurasthenia group have an IQ of 92, a mental age of 13 years, a median eighth-grade education, with only 5 per cent. who have no schooling. Psychasthenics have an IQ of 100, a mental age of 14.9 years, a ninth grade education, while none was wholly without schooling.*

This general picture leaves a strong impression that even among enlisted men, who did not represent the highest levels of the population, there was yet a definite relation between the intelligence level and the kind of abnormal behavior exhibited. Hollingworth comments that officers differed from private soldiers in the same fashion, and quotes Rivers as having observed the differences also. Rivers found that privates were especially liable to hysteria, and that neurasthenia affected privates "more frequently and usually more profoundly." These two types of nervous imbalance usually show quite obvious bodily symptoms. The officers, according to Rivers, were more likely to be affected by the mere "anxiety states," which are among the chief symptoms of the type designated as psychasthenic.

The social helpfulness of all of this will not become manifest unless we devote a little study to Hollingworth's several hundred pages of tables of facts and penetrating discussion. He gives us what seems to me, after wading through many researches in abnormal psychology, to be the clearest and most helpful description of the various types of functional nervous disturbance we find around us. As I can not repeat too often, we can help our fellow man only by understanding him; and I can think of nothing more helpful to that understanding than a fairly clear picture of what is involved in abnormal nervous conditions. What an aid it would be to our novelists and dramatists if they could thoroughly understand Hollingworth's contribution to this field of psychology!

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*The IQs in this summing up are taken from the first table. The groupings in the third table are slightly different.

Hollingworth gives an extraordinarily clear exposition of what happens in all mental activities. After a little reflection you will agree with his division of mental activities into two rather distinct phases, namely *learning* and *sagacity*. The learning process, he maintains, is largely a process of *reducing the number, duration* and *intensity of the cues or stimuli necessary to recall past events or experiences.* When a boy learns arithmetic, at first he has to have elaborate descriptions, say, of fractions or square root. As he progresses in learning, the quantity of words, numbers and instructions he needs is gradually reduced. If he be a bright boy, a mere symbol will very soon recall these entire complex experiences vividly to mind. This is the process which Hollingworth calls "cue reduction," or "redintegration." The chief charactertistic of feeble-mindedness is its feeble capacity for cue reduction. For a feeble-minded child to recall his lesson of yesterday, you have to repeat almost the entire lesson. But to a bright boy or girl perhaps one word will recall it all. We might extend these simple illustrations throughout our whole mental life.

A person, however, might conceivably have great learning ability, great capacity to recall previous knowledge and experience by very slight suggestions or cues, and yet have little capacity to fit what he had previously learned appropriately and effectively into the concrete situations of the present moment. At every instant of our lives, a host of stimuli are flowing into our minds. Some of them are more or less strong cues to past experiences. Some are part of the context of the present moment. If we had no ability to react to stimuli appropriate to our present situation and to reject those inappropriate, our behavior would lack all consistency or purpose. The idiot and the insane approximate this mental condition. But just in proportion as we are able to *combine all these stimuli into one effective adjustment that is appropriate and profitable in our present circumstances, our behavior is wise, sane and normal.* Our fellow men say of us that we have "sound judgment" or "good common sense." As Hollingworth points out, this openness to all the cues of the moment and capacity to react on the appropriate cues of the moment, as also on the most profitable cues from past experience, is the second attribute of mental activity. This he calls *sagacity.*

If you will think of friends and neighbors, these suggestions will become clear and helpful. You are acquainted with some persons who have low learning ability and low sagacity. You know also people who have excellent, even brilliant learning ability and yet, somehow, are lacking in what we commonly term common sense. Others have great learning ability and sagacity as well. People with low learning ability and low sagacity are very dull or feeble-minded. Those with good learning ability and poor sagacity, Hollingworth believes are the neurotics or else persons on their way to becoming neurotic. People with great learning ability and great sagacity are the strong, reliable people of the community. I judge, although he does not say so, that Hollingworth would expect to find most of our social leaders and business executives in this class.

It seems to me this offers the clearest and certainly the most manageable conception that has yet been developed of the origins of nervous and mental disorders. We have seen that fruitful mental activities are those in which a very partial cue or stimulus is sufficient to provoke the ideas or emotions or bodily movements and behavior that were formerly occasioned by much more elaborate situations. This is not an abnormal process but the essential thing about mental life. Such responses, however, from very slight cues or suggestions may become neurotic, according to Hollingworth, if they are not appropriately combined with the circumstances and situations of the present moment. The prime characteristic of the hysteric and neurasthenic seems to be the tendency to permit some detail of the present situation to call to mind almost in its entirety and with almost full force some former situation. And it is practically always a former experience or situation that was unhappy and depressing. In other words, such a person lacks *sagacity.* His behavior is not appropriate to the present situation, although it may have been appropriate amid the former circumstances. We therefore properly term such behavior abnormal or neurotic.

To illustrate this conception, Hollingworth describes the case from medical literature of a girl who had frequent vomiting spells, the cause of which the most elaborate physical diagnosis failed to reveal. Her history showed that the parents had wished the girl to marry a man physically offensive to her. This had brought on quarrels and unhappy scenes. One evening after the man left, the girl was so nauseated she had an attack of vomiting. Expecting him the following evening, she vomited before he came. Thereafter, even thinking about him brought on the attack. That is, the slightest *detail* brought the former situation back in full force. In this particular case, this girl may have had a fortunate escape, but from the psychological standpoint her behavior was unsagacious and therefore neurotic.

Hollingworth further calls to mind that bears are said to be taught to dance by placing them on a heated platform, while the trainer plays a tune. In a short time they dance to the tune alone. If the animal were more *sagacious* he would notice that now there is no heated platform. It was quite appropriate when the platform was hot for the animal to dance to keep his feet from burning, but it is distinctly inappropriate when the platform is cold. We instantly say that if he had had good sense he would not have been overridden by the partial stimulus of the music, but would have reacted appropriately to the present circumstances. In other words, he lacked sagacity, the power of integration, the capacity to comprehend all the elements of the new situation.

We see this sort of thing all about us every day. People who cherish old griefs and old grudges lack the prime essential of sagacity. There is the widow who bursts into tears at some passing word of a visitor. It has suddenly brought back in full force her husband's death-bed, or some cherished memory in all its detail, although he may have passed away years ago. I have seen men and women turn pale and even faint at the mention of the name of some one with whom they had had a disagreeable experience. I honestly believe half of the jealousies, bickerings and misunderstandings between husbands and wives, and many of those between parents and children, are due just to this lack of sagacity. They see all sorts of exaggerated meanings in what the other fellow says. Even his tone of voice may cause a nervous outbreak, although his thoughts may have been a thousand miles away from the suggestion drawn by the neurotic. The mere tone calls back some unhappy experience in its entirety. People develop all sorts of chronic fears, stage frights and the like and often ruin their whole lives, not from any lack of learning ability or power of *redintegration,* but from lack of sagacity or power of *integration*—the power to combine those stimuli, both past and present, that are appropriate to a logical, consistent and balanced life.

To what precise degree this sagacity may be cultivated is not certain, but abundant experience shows it may be improved with gratifying, and even astonishing, results. There can be little doubt that the higher the intelligence of the individual the more successful any therapeutic efforts are likely to be. Sometimes joining a religious cult or taking up welfare work or some congenial study greatly helps. One friend of mine assures me that he kept himself from a mental break-down during a period of stress by the intensive study of higher mathematics. Some few seem to gain relief through psychoanalysis. The chief feature of any treatment, Hollingworth brings out, is to cultivate the habit of substituting a symbolic or ideational response for the former bodily response. A child may be terribly frightened by the dreadful sounds of acorns falling on the roof as long as he can not identify them, but the moment he has full knowledge and can substitute a symbolic response for his bodily response of terror and say, "Ah! there goes another acorn," he is entirely relieved. The same principle has a very wide application to all our mental experiences. To obtain this release for adults, it is often necessary to change the environment and institute elaborate measures.

We owe a great debt to Professor Hollingworth for bringing more clearly to light the essentials of the processes of nervous disintegration and adducing therefrom the essentials of the processes of redintegrating the mental life. It seems entirely unnecessary to ring in the Freudian concepts of the "unconscious" or the "subconscious" mind or any of those figures of speech which, as Hollingworth emphasizes, are not much different from the old demons and devils that were believed in pre-psychological times to possess the mentally disturbed. The patient should first see, if possible, how the idea arose and endeavor in every way to meet the concrete situations of life, not by tugging and pulling at his so-called "will power," not by "siphoning out the unconscious" whatever that may mean, not by conformity with his bygone yesterdays, but by an intelligent survey of the present circumstances. In other words, the secret of a sound and happy mental life is to be found in continually acquiring appropriate knowledge and in integrating and fitting that knowledge into the problems of the day and the moment. What we all need, Manstreet, in order to be "safe and sane" is to keep our learning abilities alive and active and cultivate that common sense and sense of proportion described here as sagacity.

Chapter XXIX

You are wrong if you believe

THAT MINISTERS' SONS USUALLY GO TO THE DEVIL

Just why the preacher's bad boy is so much worse than other boys and turns out so badly, has caused endless discussion. I recall that when I was a lad and looked forward to the annual camp-meeting my father helped to organize near our home in southern Indiana, this subject often formed a topic of earnest consideration. Some argued it was because preachers were too "strict" with their children, especially their boys, and that this led them to rebel, play hooky from school and eventually join the ranks of the criminals. Others advanced the theory that preachers were often too busy looking after other people's children to the neglect of their own, and this was compared to the fact that tailors usually wore old and ill-fitting clothes, and that the shoemaker never kept himself well shod.

The question was never completely settled, but I grew up with the firm conviction that the sons of preachers were dangerous boys with whom to associate, and that it was a rare circumstance for any of them to turn out to be good citizens. It may be that this notion has somewhat declined as a popular belief in recent years, owing perhaps, to a decline in the intensity of "old-time religion" and to the fact that people in general are less observant of the "behavior difficulties" which the sons of ministers exhibit. At least, it is not a matter of general consternation in the community, as it was a generation or more ago, if the son of a minister should be known occasionally to utter a "swear-word," and such minor misdemeanors are not taken as complete proof that he is headed for perdition.

Having grown up in this belief, Manstreet, you may imagine my surprise when I began to look into the matter a few years ago and found that, if we are to judge by the proportion of ministers' sons who rise to eminence, they turn out better than almost anybody else. There is a possible exception in favor of the sons of college professors, who have also at times come under suspicion of being below average in intelligence and character. But, as I have often said, when you want to find the truth you should first find out the general popular beliefs about it and then look in the opposite direction. This certainly proves to be the case when we come to a study of the preacher's bad boy. Since a number of investigations have been made, we can very briefly dispose of the entire matter by citing their outstanding results.

The first investigation that comes to hand on my shelves is *A Study of British Genius,* by Havelock Ellis. This famous study by a famous scientist includes an investigation of the life histories of ten hundred and thirty of the most eminent men and women in British history during the past fifteen centuries. After showing that the aristocracies of Great Britain had produced far more than their share in proportion to their numbers, Doctor Ellis says:

> "The proportion of distinguished men and women contributed from among the families of the clergy can only be described as enormous. In mere number the clergy can seldom have equalled the butchers or bakers in their parishes, yet only two butchers and four bakers are definitely ascertained to have produced eminent children, as against 139 parsons. Even if we compare the Church with the other professions with which it

> is most usually classed, we find that the eminent children of the clergy considerably out-number those of lawyers, doctors and army officers put together."

If we investigate other rosters of human fame we find the same astonishing proportion of ministers' sons who rise to worldly distinction. By common consent the American Hall of Fame contains the very greatest men and women of our national history.

It upsets the popular impression to discover that of the first fifty-one persons chosen by competent scholars as our citizens of greatest "credit and renown," ten were children of ministers of the Gospel. I have not examined the parentage of the last ten or fifteen persons elected to the Hall of Fame but the first fifty-one are a sufficient sample to prove the point.

If we take a more democratic selection of famous Americans such as that contained in *Who's Who*, according to a study by Prof. Stephen S. Visher of Indiana University, we find among the 24,278 biographies in the 1922-23 edition that it required 48,000 unskilled laborers to furnish one son eminent enough to have his biography included. Among carpenters, plumbers, mechanics and other skilled laborers, one out of every sixteen hundred furnished a son or daughter for *Who's Who*. The farmers did twice as well since they supplied one notable son or daughter for every eight hundred. But the astonishing thing is that among clergymen, *one out of every twenty* has a child listed among these distinguished persons! In other words, the child of a clergyman has a forty times better chance of becoming a leading citizen than the child of a farmer, eighty times better chance than the child of skilled working man, and twenty-four hundred times better chance than the child of an unskilled laborer.

I could cite numerous other studies but they all show that the sons and daughters of ministers turn out to be good and useful citizens at least as often as any other children in our population, and much more often than the general run. Whether this is due to heredity or environment I shall not discuss here. It is doubtless due both to their having a good solid heredity and a better-than-average home atmosphere. In fact, from the standpoint of future leadership, it does not matter whether the astonishing success of the children of ministers is due to heredity or to environment, or, if you please, to the will of God. The fact remains that the more children ministers have, the larger the number of leaders we can count on coming from their homes to aid in guiding our national life.

Instead, therefore, of the preacher's bad boy being a danger to his country, we can scarcely conceive of a reform which would net the nation greater profits in wealth and in the creations of inspired genius than a change in economic conditions and social ideals which would lead to larger families in the homes of our American clergy. And in their several proportions we can say much the same thing for the homes of our lawyers, doctors, successful business men and skilled mechanics, because from the homes where the parents have intelligence in their heads, character in their hearts and skill in their hands comes nearly all the righteous leadership that exalteth a nation.

CHAPTER XXX

You are wrong if you believe

THAT ALCOHOL AFFECTS BRILLIANT PEOPLE MORE THAN DULL PEOPLE

WHEN some leading lawyer or doctor or business man in a community drinks to excess, especially if he dies from the effects or commits suicide under alcoholic depression, the usual remark we hear is, "It seems a pity that our very brightest minds are the most susceptible to alcohol, and go to the dogs most quickly from its effects." People fail to notice the number of "dumbbells" and incompetents who pass out from excessive drinking. We shall, as usual, save ourselves a great deal of time, Manstreet, if, instead of trying to find examples to confirm the popular impression, we look in the opposite direction for the truth.

To demolish this popular notion I shall cite only one investigation, which, owing to its rigid experimental setting and careful analysis of the results, I think is sufficient to set it at naught.

The experiment was carried out by Prof. H. L. Hollingworth, of Columbia University, whose work on neurotics I discussed in a previous chapter. Professor Hollingworth made extensive records on six college students over a period of thirteen days with a view to determine whether the brightest or dullest of them were the more affected by either small or large doses of alcohol. By the words "brightness" and "dullness" in this case is meant general proficiency in a number of mental and motor tests which the students underwent both while under the influence of alcohol and while free from its effects. These tests involved such things as rapid mental calculations, discernment of logical arrangements among words, quickness of learning, control of the speech mechanism, steadiness of hand, coordination of eye and hand, pulse-rate and memory.

It is not necessary to describe the experiments in detail except to say that they were carried out under very severe scientific conditions. The alcohol used for the experiment was beer containing 2.79 per cent, alcohol by weight or 3.58 per cent. by volume. On some days this alcoholic beer was administered, while on other days a soft beer containing no alcohol was used instead. On two of the days only water was drunk. The students unanimously voted that the alcoholic beer was "weak" and lacked in "kick." The amount of this beer consumed by each student on the beer days ranged from three twelve-ounce bottles up to nine bottles.

I am concerned here only with the general results bearing on the relation between the proficiency of the students in all these tests and their susceptibility to alcohol. The results were highly suggestive. In Professor Hollingworth's words:

> "There is a very striking negative correlation between final proficiency and the susceptibility to the effects of alcohol. The ranking for susceptibility is almost exactly the reverse of that for proficiency. . . . The suggestion is very clear that individuals of relatively high competence are less liable to impairment in their proficiency through the influence of alcohol than are those whose constitutional capacity is inferior. . . . These two general results of the study of individual differences are extremely suggestive.
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> "Among this group of subjects, who, to be sure, are few in number, resistance to the effects of alcohol varies directly with competence, not only in the tests themselves but also in capacity for

> improvement through practice. Greater susceptibility to the effects of alcohol characterizes the individual with inferior competence and inferior ability to gain through repeated trials."

Professor Hollingworth also reviews other experiments of the effects of drugs in relation to physical and mental competence. One investigator, Schilling, studied the effects of caffein and acetanilid on twenty different people. Both drugs decreased general competence in speed and accuracy. After making an analysis of Schilling's experiment from this standpoint of the relative intelligence of the subjects, Hollingworth says:

> "In the case of both drugs, and no matter whether absolute or relative effect be considered, the retardation shown by the quick group is small, but that shown by the slow group is considerable. It is the least competent whose work is most disastrously affected by the drug."

Another investigator, Carver, studied the effects of tobacco-smoking on various performances. He found, as Hollingworth interprets his data, that "those subjects who excel in the normal performance of the tasks are those who best resist the effects of the drug. Drug resistance is positively correlated with general competence."

The results obtained by other experimenters on the effects of drugs, when interpreted in relation to physical and mental competence, are in accord with the suggestions that came out of Hollingworth's study on the effects of alcohol. The bright mind and the competent person is the one that shows the least effects. Greater susceptibility to the drug characterizes the inferior individual.

The general reader may be interested in the effects of alcohol on the proficiency of all the students. Did small or large doses increase or decrease their speed and accuracy in the tests? Professor Hollingworth says:

> "In all of the mental and motor tests here used the effect of alcohol is to reduce the score. The hand is made less steady, motor coordinations less accurate and rapid, rate of tapping is reduced, the processes of color naming, naming opposites, and adding are slowed down, and the rate of substitution learning is less rapid. In pulse rate, which must be considered separately from these mental and motor tests, the effect of alcohol is to produce a positive acceleration.
>
> "In all cases the effect varies directly with the size of the dose. In the association processes the effect of the smaller doses here employed has disappeared by the end of the experimental day, three hours after the conclusion of the drinking period. In the case of the motor processes (tapping, steadiness, coordination) and pulse rate, recovery is slower, and even in the case of the smaller doses of alcohol there is usually inferior performance or change of rate at the end of the day."*

You may ask, "What is the use of taking so much trouble to make this discovery?" The answer is that the greatest advances in science, Manstreet, have not been made with a view to finding something useful. As the distinguished historian of science, Dr. George Sarton, points out, when a race decides to care only for what is useful, its own usefulness will soon come to an

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*This and the previous quotations are by permission from the *Journal of Abnormal Psychology and Social Psychology*, Vol. XVIII, Nos. 3 and 4, October, 1923, and January, 1924, the reprints being loaned to me by Professor Hollingworth.

end. Research in science is carried on chiefly to satisfy the endless curiosity of man about life and the universe. This is one of those discoveries that you can not put to any great immediate practical use. It is certainly not a warrant for brilliant people to drink more alcohol than they are at present consuming. But it represents just one more significant step in the understanding of human nature. For that reason, like all such understandings, it gives us a sounder basis for ethics. We know a little better where to lay our sympathies, how to plan our social processes. In short, we have gone a little further along the pathway toward that objective of all science, the intelligent control of our lives and of the society of which we form a part.

CHAPTER XXXI

You are wrong if you believe

THAT YOU CAN IMPROVE YOUR FUNDAMENTAL MUSICAL CAPACITIES

A RECENT study that has the appearance of considerable reliability indicates that in America we are spending on musical education approximately the following sums: four times as much as for all American public high schools; three times as much as for all our colleges and universities; twenty-four times as much as for our normal schools.

If, to be on the safe side, we cut these figures in two, we are still spending more money on musical education than for any other single kind of education in America.

I have mentioned these facts in a previous volume,* but I wish now to emphasize an especial point on which much crucial experimentation has been carried out since that volume was published: whether or not you can improve your fundamental musical capacities by practise.

This question has not been debated by either professional or amateur musicians, the very persons whom you would suppose most eager for an answer. You would suppose too that all parents would be interested in it, because in giving their children musical training they may be spending their money for nothing with an enormous waste of time, energy and courage on the part of the child. And yet parents generally seem not at all concerned.

Musicians have not debated the question because they assume they understand the psychology of music,

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******Exploring Your Mind,*** **A. E. Wiggam, The Bobbs-Merrill Company, Indianapolis, 1928.**

whereas they know nothing whatever of any value about it. They have studied music but not psychology. The two fields of study are no more the same than are chemistry and elocution.

In fact, the psychology of music has been almost wholly developed by Prof. Carl Emil Seashore, Dean of the Graduate School of Iowa University, and the students under his instruction and inspiration. If I planned to study music or had any children who planned to study it in a serious way, I should certainly read carefully Dean Seashore's fascinating book, *The Psychology of Musical Talent.** I should also insist on taking the tests of the fundamental musical capacities that Dean Seashore and his pupils have worked out. They can now be obtained at small cost on phonograph records from the Columbia and Victor Companies, together with a book of instructions. Since these records are for scientific purposes they are sold without profit.

If you propose, however, to take up music as a profession the tests should be given by a professional psychologist trained in this particular field. This is because, as is the case with all tests of intelligence, temperament or special abilities—even motor capacities—the interpretation of the tests is just about as important as the tests themselves. However, even by taking the phonograph tests you may discover whether or not you or your children have marked musical talent or a decided lack of it.

**The Psychology of Musical Talent,* by Carl Emil Seashore, Silver, Burdette and Co., New York. It is a notable event for musicians, and for professional psychologists as well, that Dean Seashore is shortly to publish a new volume on the psychology of music entitled *The Musical Mind.* Another volume from Seashore and his colleagues is now in preparation devoted to the problems of *vibrato,* one of the most fundamental elements in musical esthetics and prior to this work almost an unexplored field. Without vibrato, singing and the sound of musical instruments would be without much of their richness and emotional appeal. Photographs of vibrato will be found in the author's *Exploring Your Mind,* The Bobbs-Merrill Company, Indianapolis.

Perhaps the most amazing thing these tests have brought to light is the fact that vast numbers of people who have fine musical talents do not suspect it. A set of these records should be in every schoolhouse in America. They would prevent the many tragedies which result from trying to force unmusical children to become musicians—a thing that Dean Seashore's work has shown is a mortal impossibility. And they would reveal a great deal of unsuspected musical talent of a high order.

But I anticipate. The popular notion of course, the assumption of most musicians, is that you can improve your fundamental musical capacities by practise. A vast deal of work, involving the careful testing and retesting of thousands of persons before and after taking musical training, shows that the popular notion is, as usual, precisely the opposite of the truth. Dr. Hazel M. Stanton, one of Dean Seashore's most distinguished pupils and psychologist of the Eastman School of Music at Rochester, New York, has just completed an intensive research with the aid of Dr. Wilhelmine Koerth. It is the outcome of eight years of study. I am very grateful to Miss Stanton for having placed her data at my disposal.*

Doctor Stanton first tested one hundred and fifty-seven adult pupils of the Eastman School of Music by the Seashore tests for the following five elements of musical capacity; pitch, intensity (loudness or softness), time (or rhythm), consonance (harmony or dis-

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*"*Musical Capacity, Measures of Adults Repeated after Music Education,*" No. 6 in Vol. I of *Studies in Psychology,* Eastman School of Music, The University of Rochester, by Hazel M. Stanton and Wilhelmine Koerth, published by the University of Iowa, Iowa City, Iowa, Oct. 15, 1930. The diagrams and quotations are by permission of the authors and the University of Iowa Press.

cord) and tonal memory. It is generally supposed that musical capacity or talent is a single unit but this is another wrong popular notion. We commonly hear it said that a person "has music" or "has not music." But Dean Seashore and his pupils have shown that musical talent or capacity consists of a large number of elements that can be isolated and measured separately. If I recall correctly what I was told on my visit a few months ago to the Dean's laboratory, he and his pupils have discovered something like eighty different elements that enter into musical talent, and at least thirty of these elements are now measured in the laboratory as a regular routine procedure. All persons have these talents in an uneven degree. You may have a keen sense of pitch for example, and a low sense of rhythm, etc., etc.

But to continue my description of the particular experiment, after a period of three years during which these one hundred and fifty-seven pupils studied music intensively under highly competent teachers, Doctor Stanton and her colleague gave the same tests over again to all of them with great care. Of course all the testing was done under the most rigid scientific conditions. The relationships between the two sets of tests were likewise calculated by the most refined statistical methods.

The authors of the research have kindly permitted me to reprint from their monograph the curves that bring out in dramatic form the extremely slight amount of improvement resulting from three years' intensive musical training in each of these five music fundamentals. (See Figure 1, p. 239.) The solid black line in each diagram represents the scores achieved by the one hundred and fifty-seven students on the first test. The dotted line represents the scores on the second test, three years later. The two lines in all cases run very close to each other throughout.

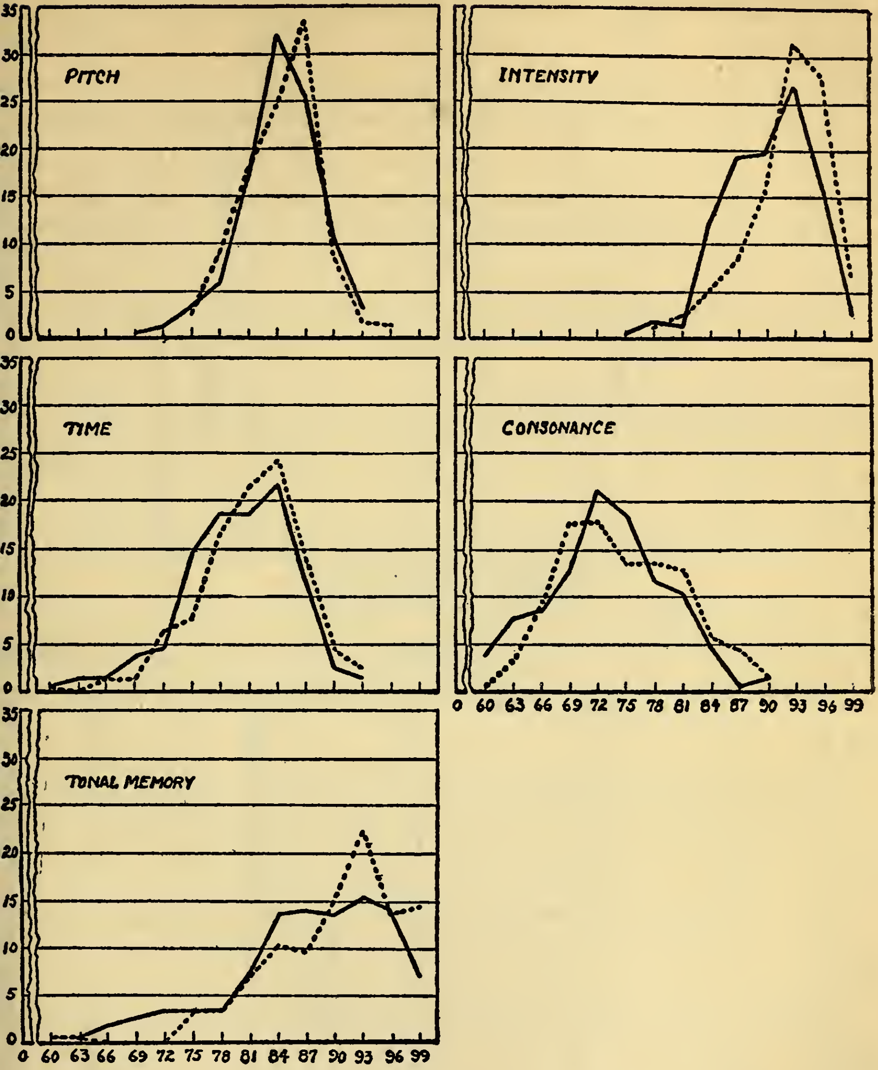
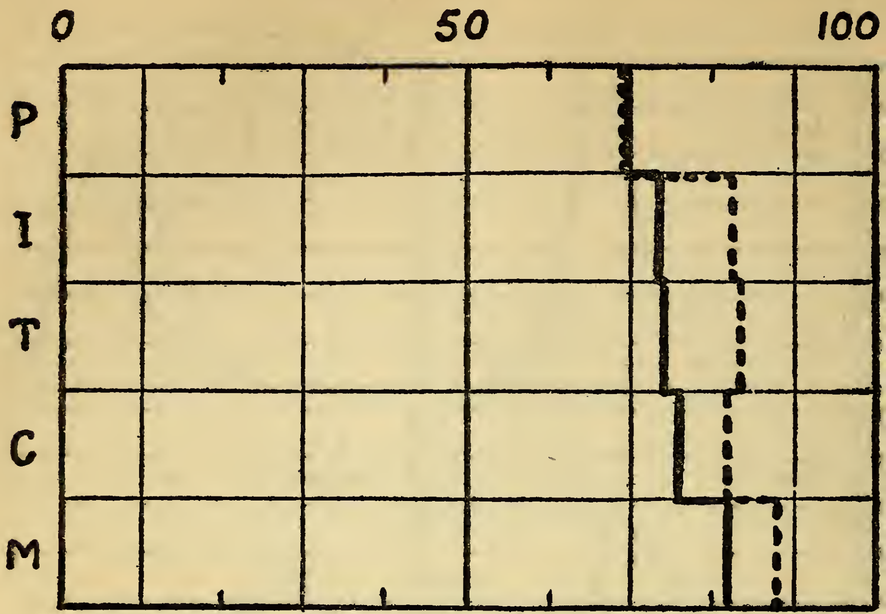
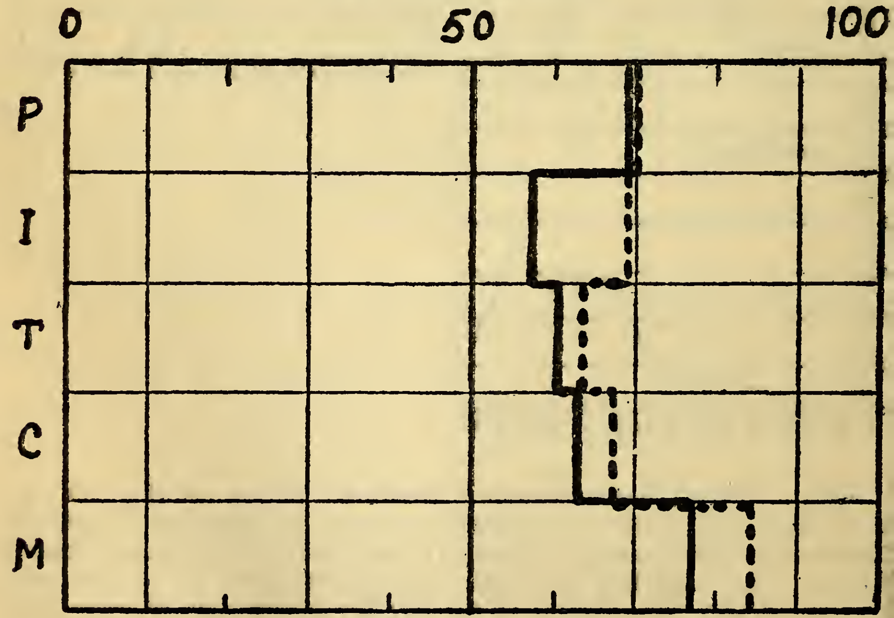


Fig. 1. From Doctor Stanton's research. Curves showing the astonishingly small amount of improvement in the five Measures of Musical Talent from three years of intensive training in music at the Eastman School. The solid line represents the first test and the dotted line the second test. The figures at the left are percentages of cases and those at the bottom represent three-unit steps in raw scores (a merely technical point for statisticians).



54 STUDENTS



103 STUDENTS

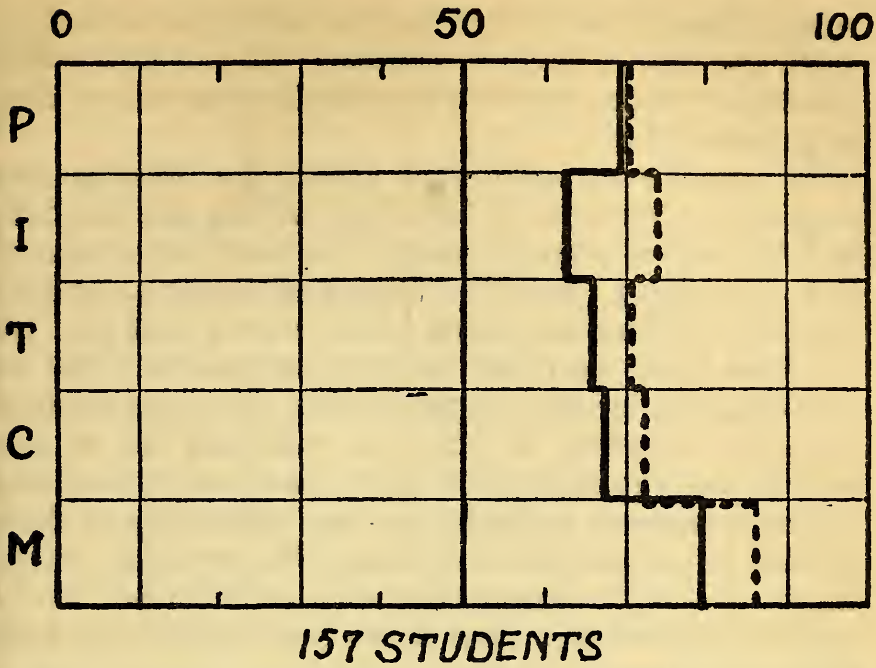


Fig. 2. From Doctor Stanton's research. Profiles of two groups and of the two groups combined derived from the average centile ranks in each of the five Measures of Musical Talent, Pitch, Intensity, Time, Consonance and Tonal Memory.

Every day in the newspapers, Manstreet, you see curves similar to these that represent such facts as the relationship, say, between commodities and securities, or between corn and wheat, or cotton and steel, and the like. I think you would say if, over a period of three years, the lines representing the average weekly or monthly prices of corn and wheat or cotton and steel ran this close to each other, that the differences would be scarcely worth considering. You would conclude if you knew the price of steel, you could predict almost exactly the price of cotton, or if you knew the price of corn at any date, you would know the price of wheat without looking it up.

I might add that it is quite unusual to find two sets of data introducing so many factors that presumably would change the second curve, which, nevertheless, leave the curves so close together. As the statistician would say, the correlation between the two sets of data is unusually high.

To provide an additional check, the investigators studied the records of fifty-four of the one hundred and fifty-seven music students who took more training than the others. Now if *training* is the cause of even the slight differences noted in the curves that plot out the final tests, we could easily ascertain that fact by studying the profiles representing the improvement made by the group of fifty-four who had the greater training, in comparison with the profiles representing the improvement made by the one hundred and three students who had lesser training. We would, of course, expect the improvement shown by the fifty-four to be significantly greater than that shown by the one hundred and three.

This assumption proves to be dramatically untrue. In the second set of charts (see Figure 2, p. 240-241) made up in profile form, the differences are no greater between the two sets of tests three years apart for the students who had the greater training than for those who had the lesser training. The top diagram shows by the black line the average scores at the beginning for the fifty-four students who were to have more intensive training. The five musical elements are represented merely by their initials at the left. The dotted line shows the second test results after these fifty-four had been put through the three years. The two profiles again run very close together. The second diagram shows the same facts concerning the one hundred and three students with the less intensive training. The final diagram shows the same facts for the two groups combined.

There is practically no observable difference in the *degree* of improvement shown by the different groups. It should be noted that both the profiles for the fifty-four students are farther to the right than the profiles for either of the other two groups. This means that they had higher musical talents to begin with. These diagrams, therefore, kill two birds with one stone: first, they show us that persons with higher musical capacity make no greater relative gain by practise than those with lower musical capacity. Second, they show us that those who take the harder, more intensive training do not improve significantly more than those with lesser training.

The critical reader may at this point raise two objections: first, that the students had reached the limit of development of their musical capacities when they entered the Eastman School; second, that the training given in the Eastman School is not of sufficiently high order to modify the higher musical elements. The first objection is disposed of by the fact that those who entered with less musical training made no greater improvement than those who entered with quite an advanced degree of training.

The second objection disappears when we know the high order of the Eastman faculty and inspect, as I have done, the curriculum during these three years. The musical achievements that have to be reached by the students are such as make demands on the very highest powers of musical execution and expression. The actual number of hours expended by this group of fifty-four students is as follows:

1. Individual lessons with voice and instrument such as piano, violin, viola, ’cello, harp, organ, flute and tympani, covering 8.4 semesters per pupil, or an average of 216 individual instrumental and vocal lessons, approximately one hour per lesson;

2. Group training in instrumental and vocal ensemble such as string quartette, orchestra, chorus, etc., averaging 9.8 semesters of group training per pupil;
3. Class subjects such as conducting, harmony, musical theory, form, orchestration, counterpoint, history of music, appreciation, repertoire, etc., averaging 13.2 semesters for each student;
4. Class subjects for general educational development such as English, language, psychology, education, etc., averaging 8.2 semesters per pupil.

After evaluating the results of the musical training experienced by these fifty-four students who had had an average of 8.4 semesters of applied music in private lessons, 9.8 semesters in group lessons, 13.2 semesters in theoretical music and 8.2 semesters in general educational development, Doctors Stanton and Koerth sum up their own conclusions in the following words:

> "No consistent or significant gain was shown in the capacity tests that can be attributed to the effects of training obtaining from an organized curriculum such as that in the Eastman School of Music of the University in Rochester."

This is a statement of great educational significance. It is true that slight gains may be seen in the profiles in most of the musical elements studied, but the investigators believe this may just as well be attributed to general mental growth or to increased general education and knowledge as to music education. They say:

> "Interpret as the reader may, the fact remains that did these tests not come somewhere near measuring native capacities there should be much greater gains after three years of intensive musi-

> cal study. Not having data on retests of groups that had no musical education in the interim between tests, we are not justified in ascribing the slight gains shown for these groups to the effects of music education—the gains as well as the losses can easily be due to cognitive factors as well as other attendant circumstances."

As to the intensely interesting question of how much our musical capacities improve as we grow from babyhood to adulthood these investigators now have a research under way. Some researches have already been carried out by Dean Seashore. He tells me that he tested his own children at five, ten and fifteen years of age in some of the musical elements and found no marked improvement. The Eastman investigators plan a prolonged study that will require the repeated testing of the same children over a period of fifteen to twenty years—including groups subjected to musical education and groups without it. This research, when completed, will have a great significance in many fields of education.

It is interesting to note the profiles for each one of the five musical elements. (Again see Figure 2.) Notice, for example, that in all three the black line and the dotted line representing the sense of pitch are almost identical. The profiles for intensity and time show a more marked variation, as also those for consonance and memory. This bears on a popular notion that is well-nigh a religious belief among professional musicians and music teachers,—that they can enormously improve the sense of pitch. They also devoutly hold, but not with quite such fervor, that they can improve the sense of time, consonance and the musical talents generally. Yet we see by this large scale experiment that pitch is the one element of musical capacity in which the improvement is practically zero!

Frequently I have called these facts to the attention of music teachers, because many of them, with the best of intentions, do a vast amount of harm. They lead parents and students to believe that they can practically create musical capacities where they do not previously exist. A high percentage of music teachers—probably a majority—honestly believe that practise and effort alone will give people the capacity both to execute and to appreciate music. But, as I have said, students of music are not necessarily students of scientific psychology.

Many music teachers show a high degree of irritation when these assumptions are assailed. I have had numerous teachers say to me, "It's no use to tell me that you can not give a boy a sense of pitch when he does not have it. I have had plenty of boys come to me who, to save their lives, could not sing on key; but in a short time I have had them singing in perfect tune."

They are telling the truth about the results of these particular cases, but like all popular explanations of natural facts, they have the wrong explanation. What really has happened is that the boy had a very excellent sense of pitch, but he had imperfect control of his muscles, his respiration and vocal-cords. And just because he does have a natural sense of pitch and for no other reason, he soon learns to control his vocal mechanisms. He has simply learned to tune his muscles and has not developed a new musical ear.

Now all this may lead you to ask the question, "How in the world is it that people ever become good musicians? They certainly are not good musicians when they begin training. You do learn to become a musician by hard work and continuous practise. If you are not improving your fundamental musical capacity, what on earth are you doing?"

You touch here on one of the profoundest questions in all science and one for which no complete answer can at present be given. How we learn anything, whether to lift a spoonful of food to our mouths, or to play a violin, or to conduct an orchestra, is an enormous field of psychology in which a vast amount of work has been done, and in which many wonderful discoveries have been made. The man in the street, who always thinks he is a good psychologist, has not the slightest idea of the complexity of these problems or series of problems. If any student wishes to pursue energetically the subject of how we learn, I should recommend him to read the latest of Professor E. L. Thorndike's thirty volumes on psychology, almost all of which are devoted to this problem. It embraces a series of lectures recently delivered at Cornell University, and is entitled *Human Learning*. It is only moderately technical, and should be thoroughly studied by every college student and teacher who wishes to know something about real psychology.*

In a recent letter Dean Seashore discusses in a simple and illuminating way this problem of how we learn to improve our power to execute and appreciate music.

> "In a general way let me say, as I have maintained for many years, that the distinction between capacity, indicating an organic limit, and ability, indicating attainment through training, is a relative one. We can never separate the two completely for measurement because in all our normal activities we can trace evidence of both.
>
> "In the sense of pitch, sense of intensity, sense of time, sense of rhythm, and sense of consonance, as measured by my records, we have an approxima-

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***Human Learning*, by Edward L. Thorndike Ph.D., Director, Division of Psychology, Institute of Educational Research, Teachers College, Columbia University, *The Century Psychology Series*, The Century Company, New York, 1931.

tion to an evaluation of capacity as is evidenced by the fact that, given an ordinary amount of intelligence sufficient for the understanding of the test, there is a tendency for the record to remain constant regardless of practise, intelligence and age. As is shown by our norms we do find a significant improvement with age to such an extent that it is necessary to have different age norms in group tests, but this improvement we attribute mainly to an increased power of understanding and will to work in the act of taking the test, which is a rather rigorous mental task.

"My interpretation has, therefore, been from the first that, while we recognize these records as measures of inborn capacity representing specific talents, we should not discourage a limited amount of training in them, because that is often helpful for a clear understanding and practical utilization of a talent in musical life. The exercise of these capacities means the exhibition of elements in musical hearing and appreciation, and it is good pedagogy to 'clarify the elements' as a foundation for the understanding of musical life as a whole and its full and normal functioning.

"This is the point of view I took in my *Psychology of Musical Talent,* and I have not had any occasion to change it. My favorite illustration has been the analogy with vision. Acuity of vision and color vision varies greatly in capacity, due to organic structure. This can not be improved by training. Nevertheless, all education depends upon improving the *use* of the eye. We train the artist to see colors and the meaning of organization of seeing facts, and seeing in terms of relationships; so that, while we do not improve the visual eye—and we often injure it—there is no upper limit to improvement in color vision and space perception. So it is with hearing, and by hearing I do not mean simply the physical ear but the whole nervous mechanism which conditions hearing."

This makes it seem evident that improvement in musical skill or appreciation is like improvement in any other skill. A boy of ten sees as well as he will ever see; but as his knowledge increases he learns to put two and two together, to combine size, form, color, distance, etc., into useful concepts. And while he sees no better, yet he learns to read, shoot, paint, play baseball and carry on a constantly richer life. Many of the musical elements, such as auditory imagery or musical imagery, Dean Seashore believes do improve by training. But his own experiments, combined with these, make it seem evident that many of the basic capacities do not, although the power to combine their impressions into larger wholes may improve through practise. Dull people often have the basic musical elements in very high degree, while brilliant people have them often in very slight degree. And just as a color-blind person can never become a painter, so persons with very weak musical elements can never become successful musicians. They may improve a little, but how much better to devote the same energy to those capacities they possess in much higher degree. These measurements of musical capacity are, therefore, one more step in the measurement of man, in enabling him to find his own inner possessions and thus to develop his strongest capacities to the wisest and happiest ends.

CHAPTER XXXII

You are wrong if you believe

THAT PEOPLE WHO COMMIT CRIME ARE CRIMINALS

SOME people are more likely to commit crime than others. This may be due to their environment or to their heredity or to a combination of both. I think that no scientific man, unless he be an extreme behaviorist, doubts this. I do not see how any man in his senses can doubt it. When I say that people who commit crime are not criminals, I am referring to two ghastly phases of the popular attitude toward them, and toward the methods of treating them with a view either to punishment or cure.

In the popular notion all who commit the same crime are equally responsible and should be given the same punishment, no matter what their differences in intelligence, education or environment. In the popular notion also there is a definite criminal type which can be identified by physical make-up or mental and temperamental reactions.

Neither of these notions has any foundation in modern scientific criminology. They form the background of a vast orgy of human injustice. In fact a thousand social injustices, even toward the people about us who do not commit positive crime, grow out of them.

I believe, Manstreet, I can not present what seems to me a correct view of the basic causes of a vast deal of crime in a better way than by assuming, for the time being, that I am defending a group of boys who have been brought before the court charged with a major crime. It is my way of trying to describe to you one of the most significant social documents of our time—a ten-year study of crime, conducted under the direction of Dr. Clifford R. Shaw,* of the Institute for Juvenile Research of Chicago, the most efficient and scientific institute of its kind in the world.

This study is an amazing statement of some of the largest phases of one of the greatest problems of the modern world—this problem of crime. I had not begun to realize that crime is, to such a stunning degree, a *direct result of the price and character of real estate,* of the kind of homes and neighborhoods in which boys and girls grow up, and the patterns of life that these social agencies and surroundings teach them to admire and emulate. Therefore, Manstreet, if you will for a few moments assume the rôle of a member of a citizen's jury before whom these boys or, say, your own boys, or your neighbors' boys, are being tried, and you will permit me to take the rôle of defending counsel, I shall describe this great research in a personal way and endeavor to bring its important findings home to your heart as well as your mind.

Your Honor and ladies and gentlemen of the jury:

You have heard the evidence for the prosecution. You have before you the case of the people of Illinois *vs.* this boy Tony, aged nineteen, and his two pals, William and Joseph, each aged eighteen. The indictment charges that these three boys held up the proprietor of a fruit store in the Loop district of your city of Chicago, and robbed the cash box of one hundred dollars. Since these boys have no money and their parents have none, the Court has appointed me counsel for their defense. I gladly assume the responsibility with which the Court has honored me.

***Delinquency Areas: A Study of the Geographic Distribution of School Truants, Juvenile Deliquents, and Adult Offenders in Chicago,* by Clifford R. Shaw, with the collaboration of Frederick M. Zorbaugh, Henry D. McKay and Leonard S. Cottrell, University of Chicago Press, 1929.

Now, ladies and gentlemen of the jury, you have sworn before God and man to consider the truth, the whole truth, and nothing but the truth in order to secure justice for Tony, William and Joseph. You will admit that in doing this, it is your bounden duty to consider every possible circumstance that could in any way enter into the alleged misconduct of these boys. And remember, you are not acting for these boys only, but for the boys of the whole city and of the nation. You are, for the moment, the guardians and trustees of all boys and girls everywhere, and they are pleading with you not to give them what they call a "bum rap" but, as we would express it, to give them a square deal.

The learned District Attorney has summed up for you what he calls the "facts" in the case. It is true he has related to you a number of occurrences which are said to have taken place *at the time of the entry* of the fruit store by these boys and of their appropriating the money. But do these constitute the real facts that you should consider in order to arrive at justice?

I expect to prove that he has not given you a thousandth part of the facts which you must take into account if you are to give the three boys a genuinely square deal.

In order to bring out what some of these deeper facts are which the District Attorney has entirely overlooked, let us admit at the beginning, for the sake of argument, that Tony, William and Joseph did conspire together to commit this crime. In such an event it is, of course, a natural impulse of human nature that our first thought should be punishment, the thought which seems to have entirely dominated the District Attorney's mind. Until recently this attitude toward crime has dominated the whole world, and I regret that the District Attorney has expended so much energy and eloquence in setting it forth.

But I am sure, ladies and gentlemen of the jury, you are not going to permit his eloquence to mislead you. You are fairminded men and women. I am glad to learn that a number of you have boys and girls of your own. Yet I fear the adroitness of his appeal may, notwithstanding all your education and fairness of mind, lead you into the same profound mental error into which the mind of the prosecution has fallen. It is precisely the same error that has, until recently, blinded the minds of the entire public with reference to the causes and treatment of crime. That error is this: you are likely to confuse your life, your notions of right and wrong, your ideas, your schooling, your family, your neighborhood, and what the neighbors expect of you in the way of right conduct, with the lives, notions and ideas of these boys. If you do this, you are going to give them a "bum rap" indeed. You have not considered the real facts at issue at all.

For, ladies and gentlemen of the jury, I am going to show you that the reason you are to-day in the jury-box while these boys are before you on trial is largely because you have each lived in different parts of Chicago. I shall show you by massive evidence, collected by your ablest students of social science, that if you had lived where these boys have lived, it is quite probable that some of you would be here on trial. The boys were not old enough to serve on a jury, or they might be sitting in your place. I shall show you that whether or not you begin as a juvenile delinquent and perhaps wind up in the penitentiary depends immensely on what part of Chicago you live in.

And I do not think that Chicago is an exceptional city. I believe the same thing is true of every city in the world. I believe it is true of every man and every woman, that his conduct, his notions of right and wrong, depends—to an extent we have not heretofore appreciated—on what his neighbors expect him to do, on the kind of gossip and talk about what is right and wrong that goes on about him, on how his neighbors have been educated as to what is "good" and what is "bad" human conduct. I shall show you that crime on the one hand or good citizenship on the other is, to an almost unbelievable extent, a real-estate proposition—a matter of good homes and bad homes, a matter of unified, logical community life, or of chaotic, disorganized community life.

In order to prove these statements, I shall submit documents prepared by your social student which, I think, will prove conclusively that crime is largely a *cultural pattern,* a thing that boys and girls learn just as you men learned baseball or marbles, or as you women learned styles of dress, the kind of manners proper for your dances and parties, and your general ideals of approved social conduct.

Some ten years ago one of your ablest sociologists, Dr. Clifford R. Shaw, of the Institute for Juvenile Research of your city, which, under the leadership of your distinguished state criminologist, Dr. Herman M. Adler, has become the foremost center for the scientific study of juvenile delinquency in the world, began to collect the home addresses of your juvenile delinquents and criminals.

In 1926 certain of your citizens, among whom were policemen, social workers, doctors, lawyers, teachers, and people of most modest means raised for research the Behavior Research Fund. Part of this was given to Doctor Shaw to forward his work, and he has plotted out on a series of maps the home addresses of sixty thousand school truants, juvenile delinquents and adult offenders, covering a period of thirty years.

This enormous research does vast honor to your city. Nobody ever knew before precisely where all these vast number of maladjusted people lived and how they lived. Doctor Shaw and his associates found that fifteen per cent. of your truants, delinquents and criminals have lived in one-half of your city's area while eighty-five per cent. have lived in the other half.

Now, three questions at once leap into view:

First: Are the people in the bad neighborhoods naturally worse than the people in the good neighborhoods?

Second: Is it the good neighborhoods that make the good people good and the bad neighborhoods that make the bad people bad?

Third: Do not the bad people and the good people respectively tend naturally to drift into the good and the bad neighborhoods; in other words, do not good and bad people tend to build their own surroundings to correspond with their respective character?

Before going into detail, I shall anticipate by stating the outstanding revelations of this research. It discloses that the good people and the bad people of your city have inhabited certain distinct localities consistently throughout the past thirty years. But you will be astounded to hear that while these respective localities, these real-estate neighborhoods, have not greatly changed, and the volume of crime in these respective districts has not greatly changed, yet the people inhabiting these districts have changed!

The people have changed not once but three or four times. *They have changed, again and again, but the crime has not!*

Now, Mr. District Attorney, may I inquire why you have suppressed all these tremendous facts from the consideration of the jury? You have passionately assured them that you had presented *all* the evidence bearing on the case of these boys, but here is a great body of tremendously important facts which you have either deliberately, or else through ignorance of what is going on in your own town and in your own special field of work, left completely out of view. You would thus blind and prejudice the minds of the Court, the jury, and the public in giving these boys a square deal.

I shall take it for granted, ladies and gentlemen of the jury, that my honorable opponent has failed to present this mass of evidence to you because he does not know about it or else does not realize what it means. But from this day on, no court in the world and no district attorney and no jury can leave this line of evidence out of consideration when either juvenile delinquents or adult offenders are on trial. They dare not, because it is vital in determining the issues at stake. Every City Council, every City Planning Commission, every School Superintendent, every Real Estate Board and every Chamber of Commerce must in the future consider these facts as the very heart and core of the problem of building cities fit to live in, safe to rear boys and girls in, and comparatively free from crime.

May I say here to His Honor, the Court, there will always be, in my opinion, some crime because there will always be some neurotic, pathological, maladjusted individuals. There will always be some people who by inborn heredity find it hard to fit the universe. They will always require special treatment and education. But there is no need of building a city that will enormously increase the number of these individuals, as Chicago has done and as every growing city has done and is still doing. And this document will reveal that Tony and Joseph and William have, to a large extent, been made into delinquent boys by the very circumstances under which their own city has compelled them to live.

Now, let us consider how a city grows from a hamlet, where individuals are comparatively free and always under the eyes of their neighbors, into a human monster where individuality can be easily lost and a man may become an anonymous unit, a mere helpless derelict drifting on a boundless sea, without sail, rudder or port. As a city goes through this process from a country village to a municipal empire, these students have shown it always develops what they call "zones in transition." These are the areas where the stores, factories, railroads and office buildings are slowly but ceaselessly encroaching, like a huge glacier, on what were formerly respectable residence neighborhoods. Here is "where play is crime." Here are your true slums. They are due entirely to lack of city planning and to short-sighted municipal statesmanship. They are the region of boys' gangs, cheap rooming houses, juvenile delinquency, poverty, desertion and broken homes. It is a moral No Man's Land where we find the man without a moral country. If any one of you were planted there to-day, you would suddenly find yourself without most of the great moral loyalties that support the human will and conscience, and you would doubtless be amazed at your own moral breakdown. Even in smaller cities of five thousand and upward, you find something of this same process going on.

Now, ladies and gentlemen of the jury, you will miss the whole social philosophy of such a situation unless you gather the profound significance of a remark that was made to one of these students by a working man who said,

"A man's community extends just as far as he is talked about."

He might have added that the moral code of a neighborhood is largely found in the things that make up the current gossip. Since in these transition zones a man's gossiping community extends scarcely beyond his personal gang and pals, it is almost inevitable that we would find here the Little Sicilies, Ghettos, Black Belts, Tubs of Blood, Hell's Kitchens, Bloody Twentieths and similar districts celebrated for their records of crime. If you were put into such a situation and all the social pressures that tend so strongly to uphold your moral resolutions were withdrawn, you would find no unified neighborhood, no genuine community, no real public to whom you were responsible.

A further feature of this situation of the greatest moral significance is brought out by one of Doctor Shaw's colleagues, who discovered that the average length of residence in these transition zones is only four months! Do you good men and women believe that a boy can build a home for himself in four months? Can his parents do it? Why, you parents have been a generation in building a home for your children. How could a boy build up those moral supports and lay hold of those deep roots of conduct which so strongly support you and me in four short months, only one hundred and twenty days, when you have taken a lifetime to do it for your children?

Now, these three boys were all reared in the moral chaos that exists in the heart of your city. Yet the District Attorney is assuming that they should be just as capable as he is, or as you are, to meet and challenge an imperfect world with high ideals. They can not do it because the very nervous patterns within them and the social patterns without them do not exist. They can not do it because they have been taught a different way of life by their community and their companions.

I recall a story told by your illustrious citizen, Miss Jane Addams, that bears powerfully on the situation before us. She says somewhere in her writings that the most pathetic incident she had ever known, during her many years of work with the poor and distressed of Hull House, was that of an Irish working woman whose boy some eight or ten years of age had died. The members of Hull House, after aiding the grief-stricken woman to secure a decent burial for her child, asked her what was the one thing they could do to help her most in her hour of grief. She replied in her Irish brogue, "The swatest thing you could do to comfort me heart would be to get me a day off from me job, so I could have one whole day at home to play with me baby Jamie. I had always hoped to get a day to play with little Pat, but now that he has gone, Oi'll always be sorry I could not have had a day to play with him; and if little Jamie was taken without our ever having had a day of play together, it would shure break me heart."

Can you be surprised—can even the District Attorney be surprised—to find here on trial boys whose mothers never had a single day to play with them? Would he be surprised to find his own boy here if, when he did get a chance to play, instead of the boys over in his school teaching him how to play basketball and how to fight fair and behave like what we call a gentleman, they were teaching him to pick pockets, and steal candy and neckties and handkerchiefs and other merchandise as a part of their regular games?

Well, that is the kind of life Tony and William and Joseph have led since they were babies.

I want to read to you from this research the personal stories of some of these boys—stories of their own lives which they themselves have told to Doctor Shaw and his colleagues. Doctor Shaw has prepared a large volume of such stories for the enlightenment of juries and courts and the public as to how the delinquent boy's own inner life develops and how he, not the Court or jury, looks at this great human drama.*

You may apply these stories, with little alteration,

**Jack Roller*, by Clifford R. Shaw, University of Chicago Press, 1930.

to Tony or Joseph or William. The thing that makes them powerful as evidence is that they were either written out by the boys themselves, or else taken down in shorthand as the boys related them. Doctor Shaw told me of one boy who had kept carefully a daily diary for many years, and when he wrote out a story of his life it covered eleven hundred and seventy-three typewritten pages!

But I can hear the District Attorney saying under his breath:

"Bosh! What do I care for the boy's own story? I have dealt with these boys for years and they are all liars. They tell you the most absurd stories about themselves. You can't believe a thing they say."

But these students of sociology assure me that the stories that are untrue are about as valuable as the stories that are true. The untrue stories reveal the world of day-dreams, reveries, wish fancies, the whole unreal world in which many of these boys live. Many a boy who is nagged by his mother or father or older brother and made to feel he is no good takes it out in building up an imaginary world in which he is a hero, in which he does daring hold-ups and leads his gang. In this way he makes himself feel important—one of the deepest urges in human nature.

Here, for example, is the story, slightly abridged, of one boy as it was related to Doctor Shaw. It shows especially well how delinquency becomes a traditional form of behavior and is transmitted from the older boys to the younger ones. And it is extremely worthy of note that crime nearly always begins as a gang activity. A boy does not originate a whole cultural pattern by himself. These students found by studying thousands of cases that there were usually five or six boys involved in such delinquencies as pocket-picking, shop-lifting, petty stealing from stores, and "jack rolling''—where they get a man drunk, especially a lumberjack, and roll him over and rob him. In robbery and hold-ups there were usually only two or three boys involved.

I want the District Attorney to pay particular attention to this boy's own story, when he talks about Tony and his pals ''deliberately breaking the law'' and pictures them, as he has done, as examples of crass human wickedness.

This boy says:

''When I started to play in the alleys, I first heard about a bunch of older boys called the 'Pirates.' My oldest brother was in this gang, and so I went around with them. Tony, Sollie, and my brother John were the big guys in the gang. Sollie was a little guy about twelve years old. He couldn't fight, but he was a smart guy and told stories and made plans for the gang. My brother was fifteen and could beat any guy by fighting. Everybody looked up to him as a big guy, and I was proud to be his brother.

''When I started to hang out with the Pirates, I first learned about robbin'. The boys would talk about robbin' and stealin' and went out on 'jobs' every night. When I was eight years old, I started to go out robbin' with my brother's gang.'' (Tell me, if you please, Mr. District Attorney, might not your boy be here on trial if he had started out ''robbin' '' when he was eight years old?)

''We first robbed from a junk yard,'' this boy continues, ''and sometimes we robbed a pedler. Sometimes we robbed stores. We would go to a store, and while one guy asked to buy somethin' the other guys would rob anything like candy and cigarettes and then run. We did this every day. Sollie always made the plans, and Tony and John would carry them out.

''The gang had a hangout in an alley, and we would meet there every night and smoke and tell stories and plan for robbin'. I was a little guy, so I only listened. The big guys talked about going robbin' and told stories about girls. Besides robbin', the gang went bummin' down-town and to the ball parks and swimmin'. On these trips we always robbed everything we could get.

"When I was ten, the gang started to robbin' stores and homes. I always stayed outside and gave 'jiggers.' They showed me how to pick locks and jimmy doors and use skeleton keys and everything. Every guy had to keep everything a secret. When we would get caught by the police, we had to keep mum and not tell a word even in the third degree. Some kids couldn't be in the gang because they would tell everything, and some didn't have the nerve to go robbin'. The guys with a record were looked up to and admired by the young guys. A stool-pigeon was looked down on and razzed and could not stay with the gang.

"The guys stayed together and helped each other out of trouble. They were always planning new crimes and new ways to get by without being caught. Every one hated the police. Anybody who was friendly to the police was not trusted. The plans were always secret, and anybody who talked about them to fellows outside or to the police became an enemy of the Pirates."

I could relate scores of these stories from the records in this research and from those given to me by Doctor Shaw. The District attorney thinks a jail sentence would cure these boys and be a warning to others. Let us hear from Doctor Shaw's record one boy's story as to what happens in your jails, and what a moral tonic a jail sentence administers! Will my honorable opponent please listen? This boy says:

"When a fellow first arrives in jail he is a little shy, but this soon wears off and he considers himself 'an old-timer,' a 'big shot.' The main topic of conversation was always about stealing. One guy would tell about the burglaries he had done or the big jobs he had put over. One cell buddy, Stub, a short guy, was in for petty larceny. He was the laughing-stock of the crowd.

"The old-timers would enjoy giving advice to the newcomers about how to plead and what to say. They were good story-tellers. One old-timer, by the name of Slim, was a great story-teller. All of his stories were of big burglaries and bank robberies. We all listened and was thrilled. In two days we was all good chums. I tried to be just like the old-timers, especially Slim. He rolled his own cigarettes, so I rolled mine, although I had money for tailor-made ones."

Let another boy speak for himself. It might have been your boy had he been in that neighborhood. He says:

"The first time I ever stole anything, I didn't realize I was stealin'; I just thought it was an interesting game. It happened when I was seven years old."

What is the use, ladies and gentlemen of the jury, to go further with the life of that boy except to say he soon became a delinquent, skilled in all the crime patterns of the neighborhood, and before long was an expert thief? He winds up his long story by saying of his first burglary,

"As I look back now, it seemed natural and I didn't have much fear or think it was wrong. . . . Within a few weeks I became an expert shoplifter. I liked the new game of stealing I had learned, and it really was a game, and I played it whole-heartedly. I forgot about school almost entirely. Compared to stealing and playing in the Loop, school-life was monotonous and uninteresting."

I want the District Attorney to hear the story of one more boy before he says anything more to you about "intentional wrong-doing." Here a gang of boys started out to rob a butcher shop. You don't realize how these things happen until you hear the boys talking among themselves, or opening up their real hearts to the sympathetic social worker. This little fellow says:

"We all went up to the back door, and my brother got a box and stood on it and tried the transom and it opened. It was too little for my brother or the other guys to get through. Then I was thrilled when they said I'd have to crawl through the transom. *That was the kick of my whole life.*

"I was only eight and very small, but I was too thrilled to say no. My brother boosted me up on his shoulders, and I crawled through the transom and unlocked the window and let the big guys in. I felt like a big shot after that, and that's why the big guys called me the 'Baby Bandit.' "

Now, ladies and gentlemen of the jury, you have been taught all your lives that crime is inhuman and unnatural. But don't you see how it begins as one of the most human and natural things in the world? And don't you see there are great areas in your city where these crime patterns are *taught* as if they were as natural and human a part of life as it is for your boys to be taught baseball, or for older boys in college to teach each other the styles of dress, the secrets and customs of their fraternities, and the patterns of their cultural life?

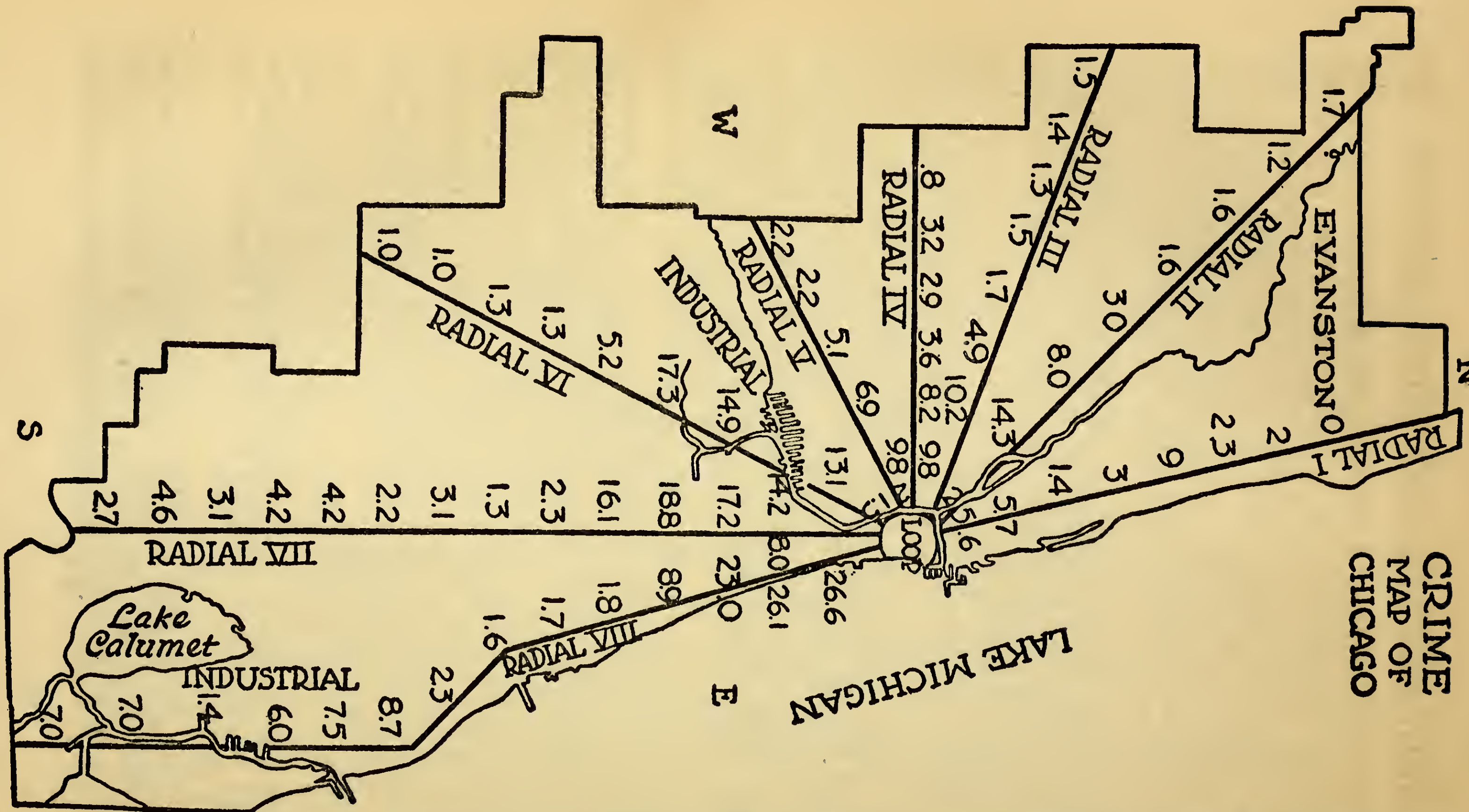
Now that you have seen how crime is largely an ideal of social conduct in many neighborhoods in your city, let us go over one of the many maps which Doctor Shaw has prepared and see where these delinquency and crime areas are, and how the populations of these areas have changed, although the old crime traditions have not changed. This particular map shows only the places of residence of the 9,243 boys between ten and seventeen years of age who were handled by the Chicago police during the year 1926. Do you realize there are nearly ten thousand boys and three thousand girls handled by your police every year, chiefly because they have learned, have been actually taught, these patterns of crime? Doctor Shaw has prepared numerous other maps in this great research for different years and different types of offenders, but this one tells the essential story of them all.

I think even a map will lay hold of your hearts if you will take an imaginary journey about Chicago, using Doctor Shaw for your guide. On this map there are eight radial lines running from the Loop to the borders of the city. For each square mile of territory that each line crosses, Doctor Shaw has set down a figure which represents the percentage of boys in that square mile of the delinquency age—ten to seventeen years—who were dealt with in 1926 by the police. This he calls "the delinquency rate."

Let us start at the northeast corner of the Loop, near Marshall Field's store and the Masonic Temple. As you look over the three square miles to the north and west, you will see the figures 25.6 at the foot of Radials I, II, and III. This sets out the startling fact that one-fourth of all the boys between ten and seventeen years old in that area were arrested by the police in this one year alone!

On the west side of the Loop you will observe the delinquency rate is 21.5, and the rate in the two square miles south of the Loop at the foot of Radials VII and VIII is 26.6.

Let us go back now to the starting-point and journey northward along the Lake Front through the Irving Park and Bryn Mawr neighborhoods, and we find an



Showing percentage of alleged male juvenile delinquents in total 10 to 17 male population dealt with by police in 1926—By mile square areas along lines radiating from the "Loop." The figures represent the percentage of boys in each square mile arrested in 1926. It runs about the same percentage each year.

astounding decrease in the number of delinquent boys. When we reach the Devon and Evanston neighborhoods, we see that not a single boy during 1926 was arrested for delinquency. Do you honestly believe, ladies and gentlemen of the jury, that the boys near the Loop are naturally twenty-five times as bad as the boys in the north part of the city?

If you go back to the Loop and journey out along Radials II, III, IV and V, through the district of substantial working men's homes, and on through the residential and commuters' zones, you meet the same astonishing decrease. If you should use the number of delinquent boys and girls as your sole criterion, you might easily imagine you were journeying toward the City of God. And it might not be so much imagination either!

Let us go next to the south side of the Loop and travel along the Lake Front toward the South Chicago steel mills and the Lake Calumet industrial regions. You will see that through the first three miles the delinquency rate is nearly one-fourth, but through the fourth mile only about one boy out of eleven is arrested instead of one out of four. Then for the next four miles only about one boy out of fifty gets into trouble with the police. However, when you come within range of the smoke and grime of the South Chicago industrial region, the rate suddenly rises again, and about one boy out of eleven is arrested.

If you go around Lake Calumet and come back to the Loop through the Chicago stockyards, you will again find these astonishing and depressing similarities between the alleged badness of the boys and the obvious badness of the neighborhood.

We come now to the startling climax of this great human drama which Doctor Shaw and his colleagues, with such high technical refinement, have unrolled before us. The District Attorney will assure you that we have not learned much of anything, and that the slum areas have always had more crime than the good residence areas. He will tell you that the thugs, the thieves and gangsters, and wicked people generally just naturally drift into the cheap rooming-house districts where they can conceal their identities. A beautiful theory, but this great research has given the comforting notion a rude shock. For Doctor Shaw has made the surprising revelation, as I have already intimated, that the districts of very little crime are occupied now chiefly by the very same people and their children who formerly lived in the low districts with their high rates of delinquency and crime. In short, the good people formerly lived where the bad people live now, and when they lived there they were just as bad as the bad people who are living there to-day.

I repeat what I said at the beginning—the people have changed, but the crime and delinquency have not changed.

Men may come and men may go, but the polluted and poisoned stream of bad housing, poverty and human anonymity goes on poisoning human nature for ever. It probably always has and, until city councils, real-estate boards, chambers of commerce and city planners do something about it, it always will.

You can not fully appreciate the unexpected climax of this drama until you understand how the populations of these low districts have been changed by the waves of foreign immigrants whose energy and imagination have made the miracle of Chicago. The first great wave came during the decades following 1850 and was almost exclusively German and Irish. Following these came the immigrants from Scandinavia, mainly after the Civil War. This migration reached its peak in 1910. These were followed by the Polish—largely

Jewish—and Italian peoples, whose migrations reached their peaks in 1914. During the last twenty years there has been an enormous movement of the southern rural Negro into the city.

"In each case," Doctor Shaw said to me, "the process has always been the same. The most recent immigrants get a footing in the areas of lowest rents around the Loop and large industrial centers and displace the population ahead of them. Those who are pushed out soon build up better homes and cleaner communities, while the newcomers take up the old crime customs. As the Germans, Irish and English were pushed out, the Scandinavians came in. In turn the Scandinavians were pushed out by the Polish Jews and Italians. These have now largely given way to the Negroes.

"*Yet the crime figures remain almost unchanged!*

"Even where the later Negroes have pushed the earlier ones out into better residence districts, the new immigrants take up the old forms and habits of delinquency, while the ones who move into better sections drop the old customs to an amazing degree and take on the better life of their improved surroundings.

"As each one of these groups has prospered," Doctor Shaw continued, "it has moved out and built separate homes and developed an integrated community life. As a result, delinquency and crime have dropped like magic. It seems an integrated community life tends strongly to integrate a man's character. When the old culture that the immigrants have left behind them disintegrates in the cheap congested districts, character disintegrates with it. A man has lost many of the old agencies of living; he is no longer a social person, talked about by a wide integrated community, but an anonymous unit in a moral chaos. One thing he lacks as a moral corrective is the gossip of a socialized neighborhood. Gossip is an extremely effective means of social control. If the gossips do not regard acts as anti-social, they are not so regarded, no matter what the rest of the world may think. We have even traced numbers of particular families who formerly lived in the low areas and who have since moved out. They and their children come into a new world of social patterns, and the rate of delinquency goes down.

"Our theory that the social background is an important element in crime is reenforced by finding how highly specialized the exact methods of committing crime become. In one district picking pockets is the most common method; in another it is 'jack rolling,' and so on. We have gangs around the Loop whose specialty is shoplifting in a particular way. They cut the bottom out of their coat pockets, so they can run their hands through them and pick up objects on the counter and slip them into the lining behind.

"Five boys were recently arrested out near Evanston for shoplifting by this method. I knew this crime pattern must have been carried out there from the Loop district. I interviewed each boy, and they all told me an older boy named John had taught them the trick. When I interviewed John, I found he had only recently moved out toward Evanston and that he had formerly lived much nearer the Loop. He told me he had there been a member of a gang, headed by a boy named Tony, who had taught him the trick. Tony, in turn, told me he had learned the device when he had been a member of a gang of boys in the Loop."

Can you then, ladies and gentlemen of the jury, escape the conclusion that, if these three boys before you, Tony and Joseph and William, did rob this store, as the District Attorney claims, this fact alone does not remotely explain the crime or give you much of a clue to the proper treatment? These boys belong to different races, and there is one point here I desire shall not escape you: This research gives a strong counterblow to the popular theories that some races have most of the virtues while others have most of the vices. We see no evidence from this study of the "noble Nordic," the "deceitful Irish," the "thieving Jew," the "cunning Italian," or even the "low Negro." As each race or nationality pushes the other out, the newcomers take up the old crime patterns with equal facility, while those who move out develop along lines of sounder social behavior.

Nor do these authors maintain, nor do I maintain, that social environment is a complete explanation of human behavior. Heredity, environment, the intellectual, emotional, physiological and instinctive factors are all concerned, yet we see from this study how extremely important is the social situation as the basic framework of crime.

Finally, then, ladies and gentlemen of the jury, while the District Attorney has sought in his opening argument to play upon your ignorance, I maintain that with this masterly study of the great human experiment called Chicago before you, he can no longer do so. He can not do it, nor can any other district attorney anywhere do it. This study has shown, as none other ever has done, that when you put people previously good into bad homes and remove the support of the old cultural habits and loyalties, you tend to make them bad; and, *vice versa,* when you put people previously bad into good homes and give them an integrated community life and those mental and emotional supports which human nature imperiously demands, you tend powerfully to make them good.

These findings also bring before you in a new and dramatic setting a fact brutally overlooked in nearly all public opinion about crime: *all criminals were at one time children.* And just so long as you maintain those real-estate areas where the Fagins and Artful Dodgers are waiting to teach children crime, you are going to have Tonys and Williams and Josephs on trial before you. You will always have a District Attorney who, as an official, will be pleading for punishment, but who, with his human heart, will be pleading for mercy. And you will have nobody possessing enough wisdom to know what to do. Nobody can do real justice to these boys now, because it is years and years too late. You can never do justice until you remove the schools where crime is taught as a regular approved part of the curriculum.

Your city and every city talks glibly about the "breeding-grounds of crime." Then, in the name of high heaven, why not remove them and put in their places the breeding grounds of character? Your own scholars have shown you not only that it can be done, but that here in Chicago on a grand, historic scale it has been done. Your own history shows you how you have yourselves created the hells where crime grows as a true native product, but it also shows you how these hells can be removed. All you need to do is to gather the might and intelligence, the heart and brain of your justly famous city builders in one united drive to forward constructively this great economic, social and human process.

You thought, ladies and gentlemen of the jury, you were called here to try the case of the people against these boys, but your scholars have shown you that you and Chicago and Illinois and America have the vastly greater case of these boys against the people. And when the people have established their alibi, these boys will easily establish theirs. Not until the people shall have freed themselves from the guilt of a vast and tragic crime against childhood can this court or any court mete out true justice; and only then will the great human dream of America, of giving to all its children an equal chance for character, education and the pursuit of happiness, be brought to its realization.

Chapter XXXIII

You are wrong if you believe

THAT THERE IS A LAW OF COMPENSATION IN NATURE

One of the favorite themes of poets and philosophers, especially those of the mystical type, has been that everything would come out all right in the end, that action and reaction, bound and rebound were equal. I must admit it is a grand and comforting conception. It makes us feel there is an all-pervading law "outside ourselves, that makes for righteousness," a generous general principle of nature that guarantees that all things shall "work together for good to them that love the Lord."

Anything, Manstreet, provided it is not positively childish from a scientific standpoint, which makes for nobility, dignity and beauty in the lives of men, I believe should be encouraged. It may be that this kind of truth—this truth of life, this truth of experience—may turn out to be truer than what appears to be scientific truth. While I am pleading in these talks that the wider use of science will add to life's happiness and spiritual values more than any other single phase of experience, yet, in our reflective moods, we grow almost appalled at the meagerness of science when we compare it to the *whole of life* and to the possibilities of human experience. So, if one wishes to go beyond the few scientific facts which the recently awakened critical intelligence of man has discovered about his universe, and construct an imaginary world where every evil is compensated by some good, every weakness by some strength, every misfortune by some good fortune, it may bring a peace, poise and confidence into one's life which in itself may "compensate" for any error the scientist might discover in such thinking.

The Asiatic races, especially the Hindu, believe they have achieved a grandeur of life by this philosophy, greater than any other concept of life could possibly bring. It is the theme that runs all through Emerson's famous essay on *Compensation.* Many people of high intellectuality and profound scholarship have a "satisfyingness" in this outlook, strangely inspiring and sustaining.

I surely have no wish to take from any one a grain of sentiment, belief or hope that gives to his life values or meanings. Life is just what it means to its possessor. The game is worth just that portion of the candle which lights each man's own pathway. Yet when I survey the filth, the maudlin superstitions, the political chaos, the brutal social castes, the chronic famine and pestilence among the Oriental races, I am forced to believe it is largely the outcome of their complacent acceptance of things as they are, their belief that some other world or existence will compensate for the evils and miseries of this one. Then when I turn and survey the more robust and dynamic life of the Western races, which I think is largely the outcome of their philosophy of life, their fearless questioning of nature, in short, their science, I am inclined to accept what seems obviously the more profitable philosophy, whether true or false in an eternal sense. If we are pragmatists, or at least practical-minded (which I confess, is a shallow definition of Charles S. Pierce's great pragmatic philosophy), we may surmise that the workability of this philosophy is likewise a guarantee of its truth, its truth in the sense of adding to the value, colors and meanings of existence.*

If we descend from grand and universal philosophies and principles to the practical conduct of life here and now, I believe science has found no evidence of this glorious theory of compensation. Indeed the sweep of evidence is quite to the contrary. True, there is action and reaction, and bound and rebound in nature. It makes a fruitful theme, especially, for cultists and mystics, to apply this quite obvious fact of physical nature to the workings of every-day life. They reason that because there is ebb and flow to the tide, day and night, rain and sunshine, the light and the dark of the moon, negative and positive electricity, etc., therefore, fortune and misfortune, happiness and unhappiness, strength and weakness, the loss of friends and the gaining of new ones, the loss of money and the finding of an unexpected bank-roll are equally guaranteed by the laws of nature, especially by the law of cause and effect. It is a bit upsetting to the theory to discover, as the physicists assure us, that the law of cause and effect is not true!

Of course it is a long lane that has no turning. A man who has had a great deal of bad luck often has a run of good luck. If you play long enough your good hands at bridge will equal your bad hands. But these are merely statistical truths. They are simply the outcome of general averages. They are not necessarily related to each other by any law of cause and effect.

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*I might interject that I do not believe the miseries of the Oriental races are altogether due to their religions and philosophies of other-worldliness. I think a large proportion of them are due to their uncontrolled birth-rate. They have too many children; and any nation with too many children is going to be chronically miserable. But even this opposition to a scientific reduction of the birth-rate is probably seated in the individual or racial philosophy. This, however, is a digression.

Bad hands at bridge do not *cause* good hands, good cycles of business do not *cause* depressions, nor is the reverse true. Nobility of character is not the cause of a great man's occasional derelictions. If there were such causal relations, there would be no reason for effort and no foundation to belief. We would know that the good man was ultimately going to turn out bad, and the bad man was certain to become a saint. We would know that every success is bound to be followed by failure, and all the fun would be taken out of succeeding.

When we look at it in this light, compensation, instead of being a philosophy of hope, becomes a philosophy of unmitigated despair. It is a discouragement of all effort, a paralyzer of all persistence and will. It leaves out of account the skill, energy and courage of the player in the game of life, by which the skilful player with a poor hand can win the money of the poor player with a good hand.

The theory of compensation is also a denial of the whole principle of biological evolution. For, if I understand anything about organic evolution after toiling for a generation to understand it, its very essence consists in its progressive mastery over environment, the increasing capacity of the organism to shape its own ends. If compensation is the law of nature, then man is an oyster, the victim of environment, the will-o'-the-wisp of fortune, the jest of chance and change. Nor is it necessary to postulate any doctrine of the "freedom of the will" to justify the theory that evolution is the progressive capacity of the organism to react profitably to its environment. Such a concept does not of necessity follow.

Whether we look at evolution as a steady emergence of life onward and upward until it arrives at God, as Lloyd Morgan and his followers have conceived it, or as a mere increase in mechanical complexity, as Herbert Spencer and many others have conceived it, or as an endless creative process, joyous in its own activity, as Bergson has conceived it, matters little for our present practical purpose. Its consummate product is at present, in so far as we can see, the individuality of man, an organism with enormous capacities to manipulate environment, and to react with increasing profit to the very manipulations that he brings about.

If, then, man has any individuality, any capacity either to choose or change the elements of life and circumstance which nature offers him, the theory that he is the victim of some overmastering law of compensation is a direct denial of all that evolution has wrought. It reduces him from the status of manhood to the status of a manikin, from an individuality to a sort of super-automaton. I say super-automaton because the "compensationists" will allow him to run for a while to suit himself, or to think he is suiting himself, to enjoy the pleasures of sin or virtue for a season, but, in the end, he is to be checkmated by this awful and implacable agency or process or principle of compensation inherent in the very nature of things. Emerson managed somehow to extract a lot of fun out of this point of view; but I have never been able to see how or why, unless it be that the so-called "New England conscience" permitted "grounds of joy" denied to us later and, by this view, less worthy mortals.

It may be, of course, that we are the victims of compensation and that all our personal efforts, hopes and desires are useless. Still we like to think, as William James pointed out, that we are in a *real fight,* that there is something to be won or lost by the persistence, courage and ingenuity of our efforts. We like to think that certain courses of conduct pay and pay eternally, and that our wages are not going to be docked, and our coin rendered worthless by some over-mastering fate. This feeling that life is a fight and a worth-while one, and that the rewards of effort are not going to be snatched from us,—surely this has been one of the dynamic spiritual forces in making Western civilization. Whether it be a grander or nobler civilization than any other, it is certainly a civilization characterized by energy; we feel as though we are doing something and going somewhere, whether we are or not. Perhaps the compensationists are right in thinking that we are merely on a grand merry-go-round, that while we believe we are riding gallant horses, bridled dragons and saddled tigers to some triumphant issue, as a matter of fact we shall soon be back at the starting-point with the organ-grinder wheezing the same old monotonous tune. According to them every leap we make forward is compensated by a grand movement of the universal machinery carrying us just as far backward. We have achieved nothing that is permanent, no success that is valid, no meaning of life that has added to its totality.

While for all practical purposes the chief refutation of the theory of compensation has come from the biological sciences, it is in this field that the popular mind is most convinced of its truth. Even in our Western civilization the law of compensation, as applied to man's mental and physical characteristics, is almost universally believed. And, like all popular notions and all untruth, it is extremely destructive. It takes mainly the form of believing that if a man has great strength in one direction this must be *compensated* by great weakness in another. If a man has great ability for abstract thought, he must have a poor memory. This belief holds that blind persons have an extraordinary sense of touch, that quick learners are quick forgetters, that artists, musicians and imaginative writers are lacking in common sense, that great power of concentrating the mind on one thing is associated with a lower power to think about a great many things, that scientists have poor business ability, that people who can work rapidly are inaccurate, that men of great intellect are likely to have weak bodies, that feeble-minded persons are physically stronger than people with keen intellects, that the good die young, and that child prodigies peter out, and so on world without end. Some of these beliefs you and I have considered elsewhere. It may be worthwhile noticing here that they have their origin largely in the doctrine of compensation.

More than twenty years ago Professor Thorndike of Columbia in his now classic work, *Educational Psychology,* exploded some of these nonsensical notions and noted the explosion of many others. As he stated in 1910, "Not all of these and other supposed antagonisms . . . have been specifically tested . . ., but those which have been so tested have been found in gross error."*

Thorndike for example showed by actual tests that individuals who learned a thousand words more quickly than the average remembered more of them after forty days than the slower learners. What a little experiment it takes to knock the "accumulated wisdom of the ages" into a cocked hat!

Thorndike also cites the following: Dr. J. McKeen Cattell, in studying the lives of the thousand most famous men and women of history, found that eminence in artistic lines implied superiority in politics or generalship or science more often than the reverse. The ten greatest generals of the world, as Thorndike observes, would almost certainly write better poetry than

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******Educational Psychology,*** second edition, Edward L. Thorndike, Teachers' College, Columbia University, New York, 1910.**

ten average men. The ten greatest scientists would probably do better in art or business than ten average men. It is indeed amazing to find how beautifully many scientists illustrate their own work. I once ventured the statement to a friend that I felt certain successful dentists have a high degree of ability as sculptors. To my surprise I found the next day that there is a sculptors' club among the dentists of New York, with a large membership and with some very fine plastic and sculptural creations to their credit! During the war we found that college professors and laboratory scientists, who had always been reputed of little business ability, proved in many cases to be such amazingly good business men and executives that a large number of them were snapped up at high salaries by leading corporations. One distinguished phychologist has stated that if the scientists would wake up and apply their talents a little more to business affairs, they could take most of the money away from the captains of finance and industry in a single generation. Scientists may yet become governors and kings!

We might cite abundant additional evidence. One of the most convincing examples has come from the recent study of the significant association between intelligence and moral character, as actually measured, in the now famous study of Doctors Hartshorne and May of Yale University. They devised tests for measuring the tendency of school children to lie, cheat, steal, be cooperative, self-controlled and persistent. After testing over ten thousand children, they found that intelligence was constantly associated with a good score on these six moral traits. There can be no doubt that intelligent adults tend toward better social conduct than stupid adults, and the same is true of children. Prof. Lewis Terman of Stanford found that brilliant children aged nine have on the average the same moral reactions and right social attitudes and conduct as average children of the age of fourteen.

Reviewing this subject in his recent excellent and most readable book, *Psychology for Students of Education,* Prof. Arthur I. Gates of Columbia University says:

> "The general tendency is for all types of desirable traits to show some degree or quality of association. *Negative correlations among desirable traits are very rare.* The general fact is that weakness in one trait implies weakness in others; mediocrity in one trait implies mediocrity in others; and strength in one strength in others. . . . The correlation of intelligence with various desirable, character, volitional and temperamental reaction tendencies is, as far as we know, positive but of moderate magnitude. Superiority in general mental ability is correlated positively, but not closely . . . with desirable physical traits. If we take a large group of individuals of the same age and divide them into two groups on the basis of intelligence, we shall find that the brighter group, as a whole, is somewhat superior in height, nutrition, sensory and motor efficiency, in resistance to disease, drugs, malnutrition, exposure, etc., and in other respects. . . . General mental ability, then, is possibly associated more or less with other desirable traits. . . . We all have our particular strengths and weaknesses, but on the average weakness in one trait implies weakness in others; mediocrity in one implies mediocrity in others and strength in one, strength in others."*

This summary of the knowledge in the field made by Doctor Gates in 1931 is extremely interesting when

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*Quoted by permission from *Psychology for Students of Education,* Arthur I. Gates, revised edition, The Macmillan Company, New York, 1931.

compared with the summary by Thorndike in 1910. It shows that science has not changed its general conclusions. The popular notion is that science is always changing. You often hear the remark, "You can't put much faith in what the scientists say to-day; to-morrow they will be saying just the opposite."

It is true that science is always changing, but it is rare that it changes its fundamental conclusions. The scientist will say something different to-morrow, but rarely will he say the opposite. It is nearly always something profounder, something truer, but something that is a logical advance on what he knew yesterday. No doubt the layman gets his wrong impression more because of the changes he sees in medical treatment than from any other cause. This is not surprising when we reflect that the practise of medicine is probably sixty or seventy per cent. art and common sense and thirty or forty per cent. science. The scientific foundations of medical science while constantly changing are always advancing. It is very rare that they are reversed. This general characteristic of all science is wittily summed up by Prof. E. G. Conklin, biologist of Princeton, when he says that science always goes forward by zigzag but you never can tell whether it is a zig or a zag.

The prime thing to remember, Manstreet, is that science always goes forward and never backward. And it is the only thing in the whole world that does always go forward. That is, as I have repeatedly pointed out, it is the only way of using the mind by which knowledge can be progressively accumulated.

So we find, when we examine human nature, that there is a tendency for strength to be linked with strength and not with weakness. This is true when you apply it to men in the mass. Of course, you will find individual exceptions. The association is not as strong as we might wish. But it is there and it can be depended on. And in my belief it is one of the greatest discoveries in all science, and furnishes our hope of improving the inborn character and strength of the human race. It signifies that if we can improve men in any one quality we shall thereby automatically improve all human nature. If we can raise the level of intelligence, that in itself will raise the average level of good-will, of social morality, of physical health, of sanity and all that men prize.

If the theory of compensation were true, that strength is usually linked with weakness, then all hope of race improvement would have to be abandoned. Fortunately, however, as with all popular notions, we discover that the opposite of the general belief is the true and dependable fact of nature. We see, therefore, from another angle that if we wish to make the world better and happier we can do it only by abandoning our popular notions and superstitions. While science may sometimes mislead us for a moment, it is the only safe and sure guide for mankind toward a larger and happier day. And that is because science is the disinterested use of the intelligence.

CHAPTER XXXIV

You are wrong if you believe

THAT EDUCATING PARENTS WILL INCREASE THE BRAIN-POWER OF THEIR CHILDREN

PROF. EDWIN GRANT CONKLIN'S famous saying, "Wooden legs are not inherited but wooden heads are," pretty well sums up one of the most important discoveries in the history of mankind. I imagine that no other popular notion has had more influence upon the stream of human history than the belief that wooden legs and other improvements of the individual are inherited, while wooden heads need not be inherited, provided we take sufficient pains to overcome their woodenness by education. In other words, Manstreet, probably the most influential misconception that the human mind has ever held, the one on which it has spent the most money, and which in the long run has probably wrought more damage, is the notion that if a parent improves himself by the care and exercise of his body, his mind or his moral character, this automatically causes his children to be born of better physical, mental or moral constitution. It has always been believed that some of the improvements of the parent would be transmitted to the bodies and minds of the offspring. You believe it, everybody except a few scientists believes it. Probably one-half the money we raise by taxation and expend for public education, public health and hygiene, and the care of weaklings and defectives, is expended with the belief that we are improving the health, character and intelligence of the coming generations.

Since the questions involved in this general problem are so numerous, so complex and so highly technical, it is impossible to review the massive and strongly indicative experiments unfavorable to the view that the acquirements of the parents are transmitted to the children. I have on my shelves a large body of the laboratory reports of numerous investigations. Every high-school biology has some brief statement of the general problem. It is a question that has roused more controversy than probably any other one in the field of biology or sociology. If you really wish to understand it, you will find it is about as involved and difficult as the quantum theory of the nature of energy.

Since I discussed this question at length in two previous volumes* I shall mention here only some very recent developments. Excellent reviews of the evidence for and against will be found in the volumes noted below.† The popular notion that improving the parents will improve the children is based on the assumption that the body cells and egg- or germ-cells are all alike and are improved by exercise. This notion was shattered when the German biologist Weissman, prior to 1900 discovered the germ-cells to be separate from the body cells. As I have said elsewhere, they are much like coins carried in the pocket. What happens to the body probably affects them very little if at all.

**The Fruit of the Family Tree* (1924) and *The Next Age of Man* (1927), The Bobbs-Merrill Company, Indianapolis.

†"Are Acquired Characters Inherited?" by T. H. Morgan, *The Yale Review*, July, 1924. Copyright by the Yale Publishing Association, New Haven, Conn.

The Biological Basis of Human Behavior, by H. S. Jennings, W. W. Norton and Company, New York, 1930.

Heredity and Human Affairs, by Edward M. East, Charles Scribner's Sons, New York, 1927.

Heredity in Man, by R. Ruggles Gates, 87 charts and illustrations, Macmillan and Company, New York, 1929.

One of the more recent experiments was carried out by Prof. William McDougall, of Duke University. His claim was that he had taught wild rats to swim through a maze and recognize an electric light at the end of one of the alleys as an unsafe place to land. They soon found that if they tried to climb out where the electric light was stationed they would receive an electric shock, but by turning into another alley that had no light at the far end they could land without this disagreeable experience. Professor McDougall claimed that the offspring of each generation learned this experience with fewer and fewer trials. He deduced that the education had been inherited. Unfortunately for this bold conclusion, Dr. K. S. Lashley of the University of Chicago, an extremely careful experimenter, secured some of Professor McDougall's rats which had become geniuses through inheriting the education of their ancestors. Doctor Lashley showed me the water maze where he put some of his own wild rats, whose ancestors had never had any such education, into competition with Professor McDougall's rat geniuses. These rats of Lashley beat Professor McDougall's rats by a significant margin on the first trial!

Hundreds of other experiments have been performed of this general character, and they have all ended in similar fiascos.

Thousands of experiments have been made to try to improve or damage the egg itself, and see if this injury or improvement shows up in the children. The problem is enormously complex. The sum of it is, however, that it is extremely difficult to affect the egg without killing it. If it should happen that the agent used to affect the egg, such, for example, as alcohol or X-rays, killed only the weaker eggs, this would result in improving the breed, since only the stronger reproductive cells would weather the onslaught. A number of biologists, particularly Pearl of Johns Hopkins, Hanson and Heys of Washington University, McDowell of the Carnegie Institution and Stockhard of Cornell, have performed experiments in which they have kept animals such as rats, guinea pigs, fruit-flies and chickens under alcohol for a number of generations. In the long run this seems to have led to an improvement in the breed. Pearl was the first to suggest that this was due to the fact that the alcohol had killed the weaker germ-cells. It is the best explanation so far advanced for the cause of the improvement. One can only speculate whether this has been true of the human family in its use of alcohol, but there is certainly no crucial evidence against it.

The most important new development and one of far-reaching importance is that of turning a stream of X-rays on the germ-cell. Among our chief American experimenters in this field are Little, formerly president of the University of Michigan, Stoddard of Missouri, Blakslee of Cold Spring Harbor, and Muller of the University of Texas. This seems to affect the offspring, particularly the grandchildren, very markedly. Other investigators have studied the effects of radium emanations and found them significant. Changes do occur in the offspring which are transmitted to future generations, where the experiments are continued under proper control. So far, however, none of these changes can be said to be "improvements." Some biologists have speculated on the possibility that all the changes in animals and plants have been brought about either by radium emanations or various types of rays of energy. In fact, nobody but a fundamentalist could believe that the physical and chemical forces of the universe do not affect the germ-cell. Many biologists, probably a majority, are pretty thoroughgoing mechanists and believe that the physico-chemical processes of the universe create the germ-cell and thus life itself.

While, therefore, the germ-cell has apparently been modified so that the offspring are different from the parents, and while some of these differences, or "mutations," as the biologists call them, are apparently transmitted, yet all this presents very little comfort to those who propose to improve the inborn characters of the human race by some necromancy of education. As Professor East remarks, "Those who hope to get blue birds from cuckoo's eggs hatched in a blue bird's nest are doomed to disappointment." We certainly have to give up the notion that if a mother practises musical exercises, or paints pictures however strenuously, it will cause her children to be appreciably more musical or more artistic. If she is herself musical and marries a musical man most or all of the children will have considerable musical ability. If she marries an unmusical man she might still have one or two fairly musical children out of half a dozen. And it is so with all human abilities. It is probably so, too, with human health, long life, moral character, sanity, insanity or any other human characteristic. They are all doubtless due to some extent to the nature of the chemical packages in the germ-cell. And they are all greatly influenced also by the environment in which the individual is reared.

But the prime purpose of this talk, Manstreet, is to plead with you not to put *all* of your money, faith and energy on environment in the belief that it alone will improve the coming generations. Put some of it, I beg of you, on heredity. In one sense all of a man's mental and physical traits are inherited, and in another sense they are all due to the environment. The egg will not grow without proper moisture, warmth and nourishment. But no amount of moisture, warmth and nourishment will produce the egg. And it is extremely fortunate that it is very hard to change the egg in such a way as to change future generations. If it were easy, Manstreet, every parent, school board, social agent or politician could change the inborn character of the generations that are to follow us. Appalling thought! Fortunately, nature has made this almost impossible.

All this means, Manstreet, that we shall continue our efforts to educate people and improve their lives because this gives to life its happiness and significance; but it is a piece of extraordinary good fortune that you and I have not inherited the effects of either the sins or the virtues of our ancestors. We have as good a chance in life as they had. The kind of persons they *were* determines to a considerable extent the kind of persons we *are;* but the kind of things they *did,* whether good or bad, the fortunes or misfortunes they underwent, have probably in nowise changed us. In short, it is a very optimistic discovery that nature guarantees to every man his own chance, the chance of his inborn strength and weakness. Out of these he must build whatever character he can and achieve whatever happiness is possible; but fortunately he is not weighed down by the mistakes and follies of the thousands of generations that have preceded him; and just as fortunately his own mistakes and follies will not be tied as a millstone about the necks of the children of the future.

Chapter XXXV

You are wrong if you believe

THAT THE LAW OF CAUSE AND EFFECT IS TRUE

That the law of cause and effect is true is a notion, Manstreet, which I can not refute from any knowledge of my own, because I am neither a professional physicist nor mathematician. But this is the case with nearly all the knowledge any one has. The very greatest scientist is compelled to take the word of his fellow scientists in the laboratory down the hall or across the quadrangle in the fields of science which lie outside his own area of original knowledge.

This goes straight to the prime characteristic of science which I have by iteration been endeavoring to impress on your mind throughout these discussions. It is the only method of studying nature by which knowledge may be steadily accumulated. All mystical thinking about the universe, expressed, as it usually is, in poetry, art, or some form of metaphysical jargon, can never add to that body of "systematized positive knowledge" we call science.

In science you can depend on what the other fellow tells you. You can add it to your own stock in trade; what is more, you can make it your starting-point for new conquests of the unknown. If you question what the scientist tells you, he can show you how he arrived at his results. Or you can, if you have the training and opportunity, try them over again yourself. If, however, you are fairly well acquainted with the fundamental principles of good scientific work, you can judge with considerable success the reliability of his conclusions without being compelled to repeat his analyses.

If you are not able to do this, you can make inquiries among a number of his colleagues and, without much difficulty, ascertain the scientific standing of his work.

Consequently I have no difficulty in accepting at their full value the statements made about the physical world by men who have a high standing with their own colleagues in physics and chemistry. And the most startling thing the physicists have told us recently, probably the most significant thing they ever have told us is that the so-called law of cause and effect will have to go overboard! It does not express a correct concept of the operations of the physical universe. Undoubtedly you should know this, Manstreet, and begin to think about it and try to teach your neighbors and your children to think about it because the denial of the law of cause and effect is likely to work a revolution in man's outlook on life, destiny and the world.

Recent discoveries bring us up squarely against the astounding concept that we are probably living in a universe which we can never understand. And this is all the more revolutionary because the physicists inform us that the reason we can never understand the universe is not because our instruments are imperfect or our mathematical formulæ burdened with discrepancies which time and patience might remedy, but because, from the very nature and structure of the thing we call knowledge, we can not bring the ultimate phenomena of the universe within its scope. They inform us that we have believed in the so-called uniformity of nature, that all things in nature are subject to immutable "law," that nothing happens in the universe without a sufficient reason, and that, by taking sufficient pains and being sufficiently clever we can unearth that reason—they say we have believed all this in the past because of our limited knowledge.

The physicists, however, now believe they have arrived at the ultimate structural elements out of which the universe is built, the infinitely little. These structural elements they call electrons, protons and photons. And they inform us that the action and the reaction of these electrons, protons and photons on one another are not understandable and are not subject to law.

Of course, you will likely say that this is because they have not studied them sufficiently, that this is an intelligent and intelligible universe, that the mind of man can understand all things and, therefore, we shall soon understand the infinitely small. But the physicists will not accept such glib answers. They inform us that from the very nature of the case the action and reaction of the ultimate particles can not be analyzed and, therefore, it is meaningless to look in them for the details which might enable us to understand them. To understand any situation we must get into some sort of connection with it; we must ourselves experience some sort of interaction with it. But scientists have come to the belief from actual experiment that the interaction of electrons and protons and the "bullets of radiation," called photons, is the smallest interaction that can possibly take place. We can not analyze a thing that is smaller than the smallest thing that could possibly be devised to measure it. The interaction of these ultimates, since it can not be analyzed, can not be explained. It is impossible from the very nature of knowledge to explain a thing that has no intelligible relationships, no measurable parts. As a consequence knowledge vanishes and anything beyond these ultimate interactions is meaningless.

In other words the physicist suddenly finds himself in a universe from which the bottom has dropped out. He finds himself standing on the edge of nowhere. Intelligence can not grasp what is unintelligible. Appalling as it may seem, the physicist has revealed to us that we are living in a world which can never be comprehended by the human mind!

Now it would be surprising, Manstreet, if these statements were clear to you, because they are certainly not very clear to me. They are merely my effort to state baldly in a few words my dim comprehension of these revolutionary discoveries and conclusions. I have, indeed, read certain discussions time and again and pondered over them in an effort to adjust my mind to the changed world to which the physicists believe they have introduced us. I am particularly indebted to some papers by Prof. P. W. Bridgman, a distinguished physicist and Hollis Professor of Mathematics and Natural Philosophy in Harvard University. I have wrestled also with some of the papers by Prof. Arthur Compton of the University of Chicago, who received the Nobel prize for his researches on the structure of light. I have struggled, mostly in vain, to get some inkling of a famous address, entitled *The Principle of Uncertainty,* delivered by Doctor Heisenberg of Germany before the British Association for the Advancement of Science in 1928, where it created intense excitement. But I have been aided most by the papers of Professor Bridgman because he has in them made an effort, and I think succeeded as well as the nature of language will permit, to describe the significance of these discoveries to intelligent people who have a fair degree of acquaintance with general science, although the experimental and mathematical processes by which the results are reached can be understood only by those who are specially trained.*

**The New Vision of Science—The Quantum Theory* and Its Staggering Significance, by Prof. P. W. Bridgman, *Harper's Magazine,* March, 1929. (The latter portion of the title is apparently appended by the editor.)

The Recent Change of Attitude towards the Law of Cause and Effect, by Prof. P. W. Bridgman, an address delivered at the University of Wisconsin April 21, 1931, published in *Science,* May 22, 1931.

Perhaps I can point out the gist of one or two of Professor Bridgman's excellent illustrations and so give you an inkling of what it is all about.

He says that if you had a billiard ball moving on a table without friction and should find that at the end of the first second it has moved one foot, you would know at the end of two seconds it would be at the two-foot mark. But if you were dealing with an electron instead of a billiard ball this experiment would fail. At the end of two seconds you might sometimes find the electron at seven feet and sometimes at five feet, or sometimes one or two feet in the opposite direction! These are certainly queer capers for a physical object to cut, and common sense would say at once that such behavior followed no law and was, therefore, unintelligible. While this ideal experiment has not been actually performed, many other experiments have been performed, and always with complete success, which make it certain that this is what would happen if the ideal experiment were carried out.

Professor Bridgman further points out that if an electron should strike against a proton or photon, you could not tell what would happen as a result of the collision. If two billiard balls collided, a school-boy could calculate what would happen if he knew the velocity, elasticity and position of the balls, and the other factors involved. But when electrons, and these other ultimate particles of light and electricity out of which the universe is built, collide, the result is utterly unpredictable. He argues brilliantly with numerous illustrations as to why this is true, and why it is known to be true. But the upshot of it is that in this world of small things the prime feature of the law of cause and effect, namely, *predictability,* has all gone to pieces.

Curiously enough you have come here into a world where the more accurately you measure one thing, the less accurately you are able to measure other things!

This is one feature, as I understand it, of Heisenberg's now famous Principle of Uncertainty. You can for example, so I understand him to state, measure the exact position of an electron, but when you do so you sacrifice all possibility of measuring the speed at which it is moving, that is, its velocity. Or, if you choose, you can measure its velocity, but if you measure its velocity you have to sacrifice the possibility of measuring its position.

This "uncertainty" is due to a characteristic of the mind which makes it impossible for us to comprehend a fact of nature except in terms of some sort of measurement. Now, owing to the fact that if we measure the position of an electron or bullet of radiation at any given time we lose the possibility of predicting what its position will be at some subsequent time, or if, choosing to measure its velocity, we sacrifice the possibility of measuring its position, then both the position and velocity of the electron can not in principle be *simultaneously* measured. It follows, therefore, that the *electron can not have both position and velocity at the same time;* position and velocity, as expressions of properties which an electron can simultaneously possess, are as a result meaningless. In other words, the physicist has *come to the end of meaning!*

It is true that when dealing with large things we find a high degree of uniformity and, for all practical purposes of every-day life, such phenomena do conform to the law of cause and effect. But this is purely for statistical reasons and is not an expression of a fundamental causal reality. I say statistical and not causal because the irregularities in the movements of these small particles tend to cancel each other. As a result, in the movement of objects large enough to be appreciated by our physical senses, such as billiard balls or automobiles or the earth or the stars, the general average of the reaction of all the particles does result in what is well-nigh an infinite uniformity. And this uniformity has been expressed in the law of sufficient reason, or the law of cause and effect. But in strict literalness it is only a statistical or average series of relationship and is not a fundamental law of nature applicable to the ultimate structural elements out of which the physical world is built.

As a consequence, however, of the fact that large-scale phenomena are almost infinitely uniform and dependable, it is wise to go on conducting our daily affairs as usual. We shall continue to dodge automobiles, to refrain from jumping off high places, to resist the temptation to twist a mule's tail or throw matches into gunpowder, and generally to pursue habits that have so far brought salutary results. But the alteration in our *outlook* on the nature of life and the real structure and operation of the universe, resulting from these new discoveries, is nevertheless certain to be very great. It will take a long time for the most industrious and intelligent layman to understand the meaning of the disappearance of meaning from his universe and grasp its significance. But it is perfectly obvious that, unless discoveries to the contrary are made, we can no longer look on the universe as one that the human intelligence can understand, and this from the very limitation of intelligence itself.

In some persons the revolution may arouse the hostility that merely exclaims, "It isn't true." To others it will bring mere bewilderment. But to the man of science it will bring both humility and courage to learn that his own intelligence is a limited thing and that the task of the scientist has finite limits and is not infinite.

Personally I have no difficulty in abandoning a belief in the law of cause and effect, because it is obvious, as Professor Bridgman points out, that our notion of cause and effect and the uniform and dependable behavior of nature is not a necessity at all but is merely a matter of experience. Rather recent experience, in fact, because only scientific peoples have ever believed it. The ancients had no difficulty whatever in believing that things happen without a cause, and that causes need not have any uniform effect. But we have been taught to believe the law of cause and effect in our school books. When we got far enough along to learn the law of gravitation, discovered by Sir Isaac Newton, this concept was wrought into our whole outlook on life and the world. And when we got to college and, in philosophy, learned of the principle of sufficient reason—that nothing happens in the universe without a sufficient reason—we felt we were in a secure world indeed. I can still see my professor of philosophy, Dr. D. W. Fisher, as clearly as though it were yesterday, leaning back in his chair when we came to this lesson in the history of philosophy and saying with great impressiveness, "Gentlemen, that is probably the largest thought the human mind can think."

I wonder what the good doctor, who had an extraordinarily able mind, would say now when the doctrine seems from all present evidence to be a mass of wreckage. The physicist has suddenly found himself on the brink of a vast abyss into which he believes his gaze can never penetrate. Not because it is too dark or too vast, but because of the very nature of light, and the limitations of his own vision.

There is an element of unimaginable grandeur in this new and startling situation from the fact that the mind has been able to discover its own limitations and if the human spirit has the humble and noble courage to accept them. Yet, to me, there is in it also an element of divine comedy. Men in battle on the brink of death often find that some silly joke of a comrade will give them more courage than the sublimest poetry or the profoundest reflections of the philosopher. In a sublime and awe-inspiring situation before a strange and meaningless universe, I find myself recalling a bit of doggerel which I came across recently in a trade journal, ascribed to Dr. C. V. Young, chairman of the Committee on Meetings and Publications of the American Public Health Association. It is a gem of satire, and may really be helpful to that large body of mystically and metaphysically inclined persons, who, in the presence of a great new discovery of science that jolts their personal convictions, lose themselves and satisfy their wishful thinking by a flood of rationalizations. The verses run:

A Mr. Jenkins owned a brink
On which he used to stand and think
Of heaven above and earth below
And why the world was thus and so.
There is no better place to think
Large thoughts than on a quiet brink;
But Mr. J's became so vast,
So super-cosmic, that, at last,
While grappling with what God had wrought,
He got completely Lost in Thought.

He disappeared without a sound,
And—what is worse—was never found.

Reader, I do not say that you
Or I would disappear from view,
If we should let our thoughts expand,
But—let us keep them well in hand.*

I judge that Professor Bridgman would not be in

**The Kalends* of The Williams & Wilkins Company, Baltimore, Md., Vol. X. No. 2. Reprinted by permission of the publishers.

disagreement with the intellectual humility which the poet here urges upon us, because, he says in substance:

> "Here is a situation new and unthought of. We have reached the point where knowledge must stop because of the nature of knowledge itself; beyond this point meaning ceases. . . . The world is not a world of reason, understandable by the intellect of man, but as we penetrate ever deeper, the very law of cause and effect, which we had thought to be a formula to which we could force God Himself to subscribe, ceases to have meaning. . . .
>
> "The thesis that this is the structure of the world was not reached by armchair meditation, but it is the interpretation of direct experiment. Now all experiment is subject to error, and no one can say new experimental facts may not be found incompatible with our present interpretation; all we can say is that at present we have no glimmering of such a situation. But whether or not the present interpretation will survive, a vision has come to the physicist in this experience which he will never forget; the possibility that the world may fade away, elude him and become meaningless because of the nature of knowledge itself, has never been envisaged before, at least by the physicist, and this possibility must forever keep him humble."

When these new concepts get noised about, the man in the street, as Professor Bridgman eloquently suggests, is going to indulge in "a veritable intellectual spree of licentious and debauched thinking." He will not like to accept the finiteness of intelligence, or the statement that it is meaningless to try to penetrate beyond the electron. He will insist that there is surely a domain of "reality" that lies beyond. I know myself that our higher- and lower-plane friends and our "spiritual evolutionists" are going to insist that man will gradually evolve until he becomes at home in this higher and purer realm, free from the limitations of the physical universe. He will insist that there is "something," some "reality," beyond the ken of the scientist, but to quote Professor Bridgman again:

> "This imagined beyond which the scientist has proved he cannot penetrate will become the playground of the imagination of every mystic and dreamer. . . . It will be made the substance of the soul, the spirits of the dead will populate it; God will lurk in its shadows; the principle of vital processes will have its seat here; and it will be the medium of telepathic communication. One group will find in the failure of the physical law of cause and effect the solution of the age-long problem of the freedom of the will; and on the other hand the atheist will find the justification that chance rules the universe."

Personally I have no philosophical speculations about it. The student of science has become so accustomed to accepting whatever he finds, and to endeavoring to shape his life to fit the facts of the universe as science reveals them, that he goes on his way undisturbed whatever may be discovered. Even Emerson remarked that if the universe should disappear we could probably get along without it. And it seems in one sense that is about what has happened.

But I have always held the belief that the less men speculate about things beyond their knowledge, and the more they prove whatever they can prove, and hold fast to that which is good, the more they will devote their attention and energies to making this present world a clean and happy place in which to dwell. No amount of speculation is going to change the "things that eternally are"; but cordial good-will, cooperation with your neighbor, tolerance, kindliness and hard work will enormously change, and I believe improve, the social order. For if life teaches a man wisdom, it must teach him that there are just two things in the universe, things that can be changed, and things that can not be changed. To me, therefore, the truest wisdom of life is to recognize that, whatever may be the nature of the life process or nature of the processes of the physical universe, they belong among the things that can not be changed; and to realize that the social process, and our own functioning in it, are things that can be changed. My own feeling, therefore, is that devotion of our thoughts and energies to making these more beneficent and effective will for ever be a task sufficiently adventurous and inspiring to keep a wise man happily busy and busily happy while he is here.

CHAPTER XXXVI

You are wrong if you believe

THAT ONE MAN IS AS GOOD AS ANOTHER

IN THE vast treasury of false notions that fill your head, Manstreet, I doubt if there is one which has had as profound an effect on history as the notion that one man is just as good as another, or as the Irishman said "equally better." All the great religions of the world have this notion running through them. They all imply that there is a good time coming when the last shall be first, and, what seems to please the common man even better, when the first shall be last. Especially all through Christianity there runs the concept that there is going to come "a great day of the Lord" when with a world-sweeping sword He will tumble the mighty ones in the dust and distribute their wealth and power among the masses.

The common people throughout all history have been so brutally maltreated and oppressed that you can scarcely blame them for being animated by such a hope. The error of their popular notion has been their failure to see that what they really should want is not that the first be pulled down from their high place and made last, but that those who are first should be the best and wisest heads among them because it is only wise leaders who can lift the last up from their helpless estate. People think they can govern themselves because they think the masses can lead. The result is that they allow leaders no wiser than themselves to gain control.

The injustices of societies, which you, Manstreet, think come from a wrong distribution of wealth and power, come chiefly from a wrong distribution of character and ability. You do not believe this because of your notion that all men are created equal. This was perhaps first erected into a definite political and social creed by the French philosopher Rousseau. He and his successors argued further that, where men were not equal in wealth and wisdom, education, a vote for all and a proper distribution of wealth would make them equal.

This notion not only goes to the very roots of your character, but it has constituted the basis of nearly all the social, political and economic panaceas of the modern world. Until you abandon it and substitute for it the notion that some people are better than others, not only as an intellectual concept but as the energizing goal of your social passions, I do not believe you and your fellows can possibly achieve permanent social welfare or happiness.

As the first great exemplification of your notion that one man is as good as another, you managed, after a century and a half of agitation, to give everybody a vote. This was to be the cure for all our social and political ills. Has the "cure" proved efficacious? Has it made everybody equal in intelligence, character or knowledge? Certainly the Army Mental Tests put a quietus on any such fantastic hopes. Whether you regard the Army Mental Tests as tests of intelligence or tests of education makes little difference. They showed conclusively that a great many of these young men to whom you had given a vote to cure our social diseases could not tell why it is cold at the North Pole. To aid them in answering this question they were given three ready-made answers from which to choose the correct one. They were asked to decide whether the reason for the cold climate at the North Pole is that it is so far away from the sun, or that the light falls slantwise, or that there is so much ice there. A most distressing proportion of these young men in the prime of their mentality could not answer this momentous question. Yet you not only ask them to decide, but believe their decision is the only right one, on any "noble experiment" you may wish to try. That is to say, you trust the decision of great national questions to voters, a great many of whom we have discovered *by actual experiment* can not tell whether it is cold weather that makes ice or ice that makes cold weather. You still confidently assert that the voice of the people is the voice of God. It seems to me, Manstreet, that this concept reflects seriously on the IQ of Divinity!

Of course, you could put me in a rather tight place by asking me what I would offer as a substitute. But that very question illustrates your whole attitude toward social, political and economic problems. You have an instinctive belief that whenever we do not know what is the wise thing to do, we *must do something.* Your notion is that we must always be tinkering with government or with social machinery or moral character, particularly the moral character of other people. When things do not suit you, even when all men admit things are going rather badly, we must immediately do something about it instead of setting to work to study what to do. A meeting must be called, resolutions must be passed, committees must be appointed, especially committees to "frame legislation." Such a thing as trusting to human nature just to guide itself for a while and muddle along somehow until we learn what to do and more about how to aid human nature—this is something that never occurs to you. You claim your supreme trust is in the "common people"; but the common people are the very ones you do not trust, for you are eternally trying to tinker with their moral character and their economic and political fortunes.

If you believe, Manstreet, that I am talking without evidence, I can do no better than call your attention to some of the wisest words of our current utterance. They are the words of a man who helped to bring about nearly all of the reforms of the past generation, the tinkerings with social machinery and other people's happiness and character. He has come out of it with a deeper faith in human nature and its possibilities than ever; but he has executed the marvelous intellectual and spiritual feat of coming at last to see that the greatest reform men can achieve is to educate themselves in the understanding of one another and in tolerance of one another's different education, inborn superiority or inferiority, and clashing points of view.

Lincoln Steffens, you may recall, helped to start the "muck raking movement" of a quarter of a century ago. He has been the friend of kings, dictators, premiers, presidents, politicians, tramps, crooks, saints, princes and paupers all over the world. He has been one of the greatest crusaders of modern history, both moral and political, and it is certainly illuminating now, when his autobiography is deservedly one of our best-sellers, to hear him tell the story of this cycle of reforms, each one of which was to usher us into an abrupt millennium. In a recent interview with Lemuel F. Parton of the *New York Sun*, he gives in a few brief paragraphs so much of the social wisdom which I wish I had power to enforce that I have secured the permission of Mr. Parton, the *Sun* and the Consolidated News Service to quote it in full.

The following pointed questions were put to Mr. Steffens.

"There are graft scandals in about twenty American cities, from the biggest ones on down. There are cities in imminent fear of seizure by criminals. Since you started muck-raking, the word 'racketeer' has worked itself into the dictionary. Whether the facts justify it or not, the public is both cynical and pessimistic about politics and politicians. Organized extortion has been added to the official corruption which you assailed. Murders in proportion to the population have doubled in thirty leading American cities. What's the matter? What happened to your reform?''

There was no hint of cynicism in Mr. Steffens' reply.

''The trouble with us reformers,'' he said, ''is that we won. Since the start of the muck-raking movement, we have put over the anti-trust laws, prohibition, the referendum and recall, the direct primary, the regulation of public utilities and the direct election of United States Senators. We have gone a long way in establishing the commission form of government and the city manager's system. We have drawn the lines against the power monopoly and driven ahead in the public ownership fight. We made the war and we made the peace. Make no mistake about it—under President Wilson's leadership, it was the liberals who made war and peace. So, summing it all up, we won. There's no doubt about that.

''But, with all this fighting, with all these victories, we did not change, affect or improve any single essential. In fact, we fought over almost everything but the essentials. Instead of trying to find out why men behave in certain ways we tried to make them behave our way. We knew nothing and discovered nothing about motivations of conduct.

''We proclaimed a knowledge of good and evil which we did not possess. We made our hard categories into which we put good or evil men or good or evil events. We made assumptions, reinforced them with the emotions of conviction and became righteous. Being righteous, we could no longer think, for righteousness excludes everything except its own obsessions.

"The reformer won't let life go its own way. He makes rigid molds out of words—virtue, democracy, justice, liberty—and tries to pour this stuff into them. Laws are to him instruments for making other men behave according to his idea. When he starts multiplying laws, the worst thing that can happen to him is to win. And, to repeat, that's what happened to us. We won.

"Somebody should have taken us aside and quietly whispered in our ear some of the economic facts of life. That's one thing. Another thing is the one great essential involved in attitudes. We didn't believe enough in life. We laid heavy hands on it. We made condemnations which bred hatred and bigotry. Believing in life means believing in each other. That's an essential we overlooked.

"How futile all our frantic little reform appears in the light of what happened in the last few years, with five great empires toppled over, the gigantic experiment going on in Russia, the ruthless examination to which capitalists themselves are now subjecting our system of life! Sometimes I think everybody has been thinking except the reformers."

These are the wise words of a wise man. What gives them added force is they are not prophecy but history, not theory but experience. I quote them at such length for the reason that they illustrate with singular clarity the purpose of this book. That purpose is to advocate no reform except the one reform of understanding human nature by means of actual scientific exploration of its operations and, when human nature is thus better understood, making social provisions for the enormous differences in individuals. Mr. Steffens has obviously learned the greatest lesson this age has to teach us. That lesson is the application of the methods of science to all the problems of society and life. But the notion you hold that you have laid the basis for a happy society by the grandiose assumption that one man is as good as another destroys all hope of working out such a social order. It leaves us without even a starting point towards a society of permanent peace and good will. All the "reforms," beginning, say, with manhood suffrage and coming on down to our present-day vast schemes for making people good by law, have inherent in them the false notion that men are equal in intelligence, character and social responsiveness, and that their defects and inequalities spring from defects and inequalities in social machinery. If we could just cure the social machinery, all men would respond equally and straightway live lives of wisdom, tolerance and beauty! But as we look back over the staggering array of attempted improvements in our social machinery, we see that this obvious improvement in human nature has not taken place.

And if we now turn our attention in a totally different direction, away from the blatant propaganda, the huge conventions with their revolutions and slogans, the brass bands and flying banners that were to usher us at various appointed hours into the millennium,—turn from these to the quiet and unostentatious laboratories that have been engaged in the study of human nature, how to measure it, how to organize its habits of thinking and conduct, how to build its character, how to educate its intelligence and emotion, we come, Manstreet, into a totally different world. If we go on into the laboratories of the sociologists, the economists, the statisticians, the political scientists, we go into a world of hope and promise for man's future happiness, a world of effort different not only in degree but different in kind from all previous efforts to reform mankind or the world. The difference, it seems to me, lies just here:

All previous efforts at reform have proceeded on the theory that human nature is a set of grand general principles, that everybody has pretty much the same general intelligence, will respond about equally to any set of rewards and punishments that may be devised, and that their motives are all about the same. But the thing that has emerged from three centuries of science, particularly the past generation of experimental psychology and biology, is the astonishing individuality of the individual. Experiments by the thousands and the millions have demonstrated the astonishing differences that exist between one man and another man. An increasing body of evidence also tends to demonstrate that these differences are due considerably more to nature than to nurture, to heredity than to environment, and that they do not greatly change during the life of the individual. It has, of course, demonstrated conclusively that individuals may be changed to a marked degree by education and environment; but all of this has not changed the fact that the chief differences among men are in all probability inborn. Not only do they appear to be wrought by nature into a man's very blood and constitution but his children tend to a considerable extent to be like him.

Once you recognize as a fact of life that men will not respond in the same way either to rewards or punishments, to this stimulus or to that depressant, it is bound to change many of your ideas of education, society and politics. You see at once that there are always bound to be social classes just because all men are born unequal. In *The Biological Basis of Human Behavior,* Professor Jennings takes me to task for having made the innocent and rather obvious remark that "social classes are ordained by nature." This is a notable book and one that everybody who wishes to achieve a better understanding of human nature and society should read. Professor Jennings is not only one of the most original and productive of our experimental biologists but is also one of our profoundest thinkers on the philosophical problems to which the biological sciences have contributed a mass of significant material. He is not given to metaphysics or mystical speculation. With all good spirit, I can not but wonder how Professor Jennings believes social classes arise if they are not the products of the natures of men. No one believes they drop out of heaven. If they do, heaven visits upon man a vast deal of social injustice.

It is probably true that I should not have used the word "ordained," because it might signify that some super-intelligence has imposed this situation upon mankind by a sort of voluntary mandate. But certainly the biological sciences have done more than anything in man's history to demonstrate the enormous differences among men, and to demonstrate that these differences can be changed to only a moderate degree by environment. And if we grant that some men are born with more energy, intelligence, self-control, good health, shrewdness, cunning, kindness, brutality, honesty, deceitfulness than others, it seems incredible that these differences would not play a part in developing social classes. If they do not, then brains, character and energy are of no use to a man, and dishonesty, cunning, stupidity and laziness are just as useful, just as socially worthy and effective.

Professor Jennings does not believe this any more than I do. His whole book makes it obvious that he believes that the biological basis is the chief basis of human behavior, that men behave as they do more because they are born that way than because they have been educated that way. This does not in the least destroy our belief that improvement in education and environment will improve all men. They will, as Professor Jennings and all men competent to judge such matters agree with enthusiasm; but, as most of them likewise agree, it is the men with the better inborn traits of intelligence, energy and character who will respond most readily to this improvement and gain the greatest advantage from it.

As I write these words, the postman hands me the current issue of the *Journal of Experimental Education,* and, as passing evidence of the truths of these suggestions, I find in it an admirable study by Dr. Frank T. Wilson, of State Teachers' College, Buffalo, on the differences in the learning ability of bright and dull children. The differences are all in favor of the bright children. I turn to another study by Dr. R. J. Clinton, of Oregon State College, on differences in mental and motor abilities between white and Negro children. The differences were all in favor of the white children. Some of these differences may be due to the fact that one group has had more education than the other group. It is not likely, however, that this could be urged as the cause of the differences between bright and dull children, unless it be to make the differences less.

It is due to this notion that one man is as good as another that we have to-day an orgy of educational confusion. Its net result is that the best education in the world to-day, the most scientific pedagogy and the most skilled teaching are devoted to the dull children instead of to the bright ones. The efforts of education have been directed far more toward lifting the dull child than toward promoting the bright child. The stupidity of this procedure has been shown in its stark economic and educational nakedness by Prof. Lewis M. Terman in his Stanford University studies of gifted children. These monumental studies have brought out the well-nigh incredible fact that not the dull child but the bright child is the retarded pupil in our American public schools! The most brilliant children in the schools, he has found, are farther behind where they ought to be than the stupid children are behind where they ought to be! If we had found this true in the culture of some savage tribe we would consider it as conclusive evidence either of general stupidity or else of some nefarious scheme of the sachems to keep genius from showing itself, lest it rise and throw them out of their soft berths of pelf and power. But it is suffered here in America with entire complacency, not only because it is the easiest way to run a public institution but because it is a big card for inducing the public to contribute gigantic funds to public education. We flatter ourselves that it promotes democracy, is indeed the evidence of our democracy. But, the very essence of anything that can be called justice, whether we call it democracy or autocracy or theocracy or what, is *provision for the enormous inborn differences among men.*

As evidence of this popular belief in equality, a few years ago when the great ship *Titanic* was sunk and the papers noted that many "prominent" people were drowned, a general cry went up throughout the country, that they were "no better than any one else." It was alleged that if we had lost an equal number of "common people," the loss to the country would have been just as great.

But if we mean, Manstreet, by the words "good" and "bad," "better" and "worse," as applied to our fellow men, their relative intelligence and character and their relative contributions to social worth and effectiveness, a world of evidence exists that indicates we lose not only more but many times more, as a rule, when we lose "prominent" people than when we lose an equal number of average or so-called common people. When you maintain that one man is as good as another, as I have said, you do vastly greater injustice than when you regard some men as better than others. Your notion prevents you from picking out superiority and promoting it. You call this democracy. But in the kind of democracy on which you pride yourself, you fail in many individual instances to make the worthy person prominent and you demote the truly prominent person to the common level.

Of course, when I point out to you the faults of democracy, you at once jump to the conclusion that I am pleading for some sort of tyrannical overlordship by the superiors over the inferiors, but I am pleading neither against democracy nor for aristocracy as such. I care nothing for names and slogans. I am pleading for human justice—justice for the five-talent man as well as for the two- and the one-talent man. The chief concern of mass democracy is for the one-talent man. I believe that "the most unequal thing in the world is the equal treatment of unequals." But this is what you try to do. You put the bright boy and the dull boy on the same level in school. You give the bright man and the dull man equal power in determining the destinies of your country; at least you try to do it by giving each head one vote regardless of what may be on the inside of the head.

If you continue to argue that the people who prove to be successful in profession or in business are no better on the average in character and intelligence, no better in blood, if you please, may I inquire why their children furnish the great bulk of the nation's leaders? I have shown that if you examine any lists of distinguished people, you find they are born mostly from the successful classes, that is, from parents above the average in character and brains.

To be sure, such a showing is the very thing you use to bolster up your contention that one man is as good as another. You argue that the favorable environment is the reason more eminent persons come from the families of wealth or comfort, or from homes of intellectual stimulus. You have always used this as one of your strongest arguments to prove that if we could only give everybody equal opportunity, everybody would be equally successful. And nearly all revolutions have been an effort to divide the wealth and opportunity of the successful members of society with the unsuccessful, on the theory that this would make the unsuccessful as successful as the successful have been! Certainly there have been enough high-minded men and women, at least in modern times, among the highly successful who have spent incalculable amounts of time and money to give the less successful the fullest possible opportunity. This spirit may even go down in history as the most notable characteristic of our age. You believe if all had equal "advantages," we could substitute the Census Report for *Who's Who*. If the dreams of the communist come true, everybody will be equally eminent in character and achievement. But, we might ask, why did not the brothers and sisters of eminent people do as well? They had equal opportunity, but in their case at least, equal opportunity did not equalize men.

We could go on discussing this matter indefinitely, but it is difficult for me, after laboring for twenty-five years through the vast and ever-increasing body of researches, to see how anyone can cherish a doubt that some people are born superior to others. If it be not so, then all hope of improving men in their inborn health and character, intelligence and beauty and, above all, their inborn capacity for happiness and capacity to create happiness, must be for ever abandoned.

I, for one, have not given up this hope. And if I am any judge of recent changes in the psychology of Western peoples—changes many and profound—I believe this hope is an increasing one with an increasing number of people. As I look back over the several happy months of intensive toil I have spent in the writing of this volume, I realize even more than at the beginning that both consciously and unconsciously the desire to strengthen this hope has been my inspiration.

How then can the betterment of human nature and the improvement of society be achieved?

It is my hope that this volume of essays on widely varied topics has pointed in the direction at least in which the answer will be found. As we look back into the great firmament of history, it seems evident to me that one thing and one thing only has contributed toward these two objectives of the world's longing, that is, to the improvement of men in their inborn capacity for happiness and their capacity to organize their society for happiness. That one thing has been correct thinking, the right use of the intelligence, the use of the mind in such a way that it would not and could not be deceived. To this method of using the mind men have given the name of science. It is a great name, for it stands for the fearless use of the reason in meeting the problems of life and nature.

True, the use of the reason is always dangerous, the life of reason is a dangerous life, but it is only when men have sought danger, broken from their old habits and habitats, and gone out upon uncharted seas of physical or mental adventure, that they have ascended in the scale of being. This, I take it, is the crowning thought of Professor Whitehead in the conclusion to his great series of Lowell lectures, *Science and the Modern World.* The future, he says, will disclose dangers, but "it is the business of the future to be dangerous"; and a chief merit of science is that it equips man with an intellectual technique for meeting profitably these unknown dangers and duties of the future. It is one of my deepest convictions that this age in which men have used science mostly to produce power will be succeeded by an age in which men will use the scientific mentality for purposes of the spirit, for social adventure and esthetic experience. From the use of science to produce great machines men will turn to the use of science to produce a great society. They will apply the same intellectual methods to social discovery and social management that they have applied to chemical and physical discoveries and the production of material goods.

This is not an idle hope—already there are sure signs on the horizon. Our great industrial leaders, who once concentrated on the scientific production of wealth, are thinking more and more of the scientific production of happiness. More and more they are showing a sense of responsibility for the spiritual lives of those with whom and for whom they toil. If this widely discursive volume has contributed any thought or inspiration which may induce a larger number of people to cooperate in this grand adventure of using the reason, not merely to produce wealth but to create life and to release life to larger issues, my reward will be abundant and abiding. For, as Professor Whitehead says:

> "The moral of the tale [that is the tale of history as a whole] is the power of reason, its decisive influence on the life of humanity. The great conquerors, from Alexander to Cæsar, and from Cæsar to Napoleon, influenced profoundly the lives of subsequent generations. But the total effect of this influence shrinks to insignificance, if compared to the entire transformation of human habit and

human mentality produced by the long line of men of thought from Thales to the present day, men individually powerless, but ultimately the rulers of the world.''

THE END

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